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AVERTISSEMENT

Nous reproduisons ici, sous la responsabilité de leurs auteurs, quelques-uns des travaux présentés et discutés au symposium sur l'évolution, lors de la célébration du centenaire de l'Université Laval à l'automne de 1952. Nous regrettons beaucoup de ne pouvoir transcrire en même temps ces discussions, l'appareil enregistreur ayant fait défaut. Dans un numéro subséquent, nous publierons les travaux du professeur Stensiö, du musée de Stockholm, et de MM. Charles De Koninck et Émile Simard.

On the Logical Status of the Theory of Evolution

I have accepted, with great pleasure, the invitation to take part in this symposium and wish to extend my thanks, in particular, to our excellent Chairman, Professor De Koninck, for his invitation, and for the efforts he has devoted to enable us to join in the present discussion. The present paper being the first in this series, it appears that it should be in the way of a general exposition of the problem — a most difficult task indeed for a brief lecture. Such presentation by necessity involves the danger of oversimplification, and is liable to be open to criticism from the scientific as well as from the philosophical side.

It seems appropriate first to make clear the logical status of the concept of evolution. As far as our direct observation and experimentation go, the world of the living, our present fauna and flora as well as that of earlier geological epochs, recorded as fossils, presents itself as a discontinuum. That is to say we find living organisms to belong to well-defined groups which are called species. To be sure, there are borderline cases, in particular, the so-called *rassenkreise* or rings of races, which, to use Dobzhansky's (1951) [1] expression, have diverged almost too much to be considered as races, but not quite enough to be regarded good species, and which are generally, although not quite unanimously, considered to be just in the process of speciation. However, apart from a few cases of polyploidy in plants, no new species has arisen whithin our observation, let alone higher taxonomic units. Therefore, evolution is not a fact if we designate by this term something which is directly observable. Rather the concept of evolution is an extrapolation of certain facts the justification of which lies in the great amount of documentary evidence supporting it. I think the logical structure of the concept of evolution can hardly be better defined than it was by a German theorist, Tschulok (1923) [2], some thirty years ago. Surveying the world of organisms, we find that it is not a chaos of different forms, but represents a gradually diversified manifoldness. That is to say, in the so-called natural system individuals arrange themselves into species, species into genera, genera into orders, and so forth up to classes, phyla, etc. We have, further, three basic facts of observation. First, so far as experience goes, organisms arise only by way of reproduction from

1. Th. Dobzhansky, *Genetics and the Origin of Species*, 3rd ed. New York, 1951.
2. S. Tschulok, *Deszendenzlehre*, Jena, 1923.

parental organisms. Secondly, only consanguinity produces organisms similar to their parents. Thirdly, notwithstanding this similarity of parents and offspring, occasionally and quite frequently, variations from the parental type appear. If now we assume that also in the past there was no other cause of similarity than consanguinity, and if we admit that many small variations may lead, over long periods of time, to large changes, then evolution gives a satisfactory explanation for the gradually diversified manifoldness in the world of the organisms. This concept allows to explain an extraordinary amount of data — all those facts which are usually called the proofs of evolution from palaeontology, comparative anatomy, embryology, biochemistry, biogeography, and so forth, and which may be found in any textbook. Furthermore, it allows to predict yet undiscovered facts, as when intermediates between presently separated groups are postulated and afterwards found in the geological record, such as *Archaeopteryx* as intermediate link between reptiles and birds, or the series of the *Therapsida*, leading from the reptiles to the mammals. Thus, evolution is a theoretically inferred reality, to use Tschulok's term. The theory of evolution is a general conceptual scheme from which many data, already known or still to be discovered, can be inferred.

Subordinate to the question whether evolution is to be assumed, are the two further questions how it has occurred and why. The second question is that of the course of evolution, the establishment of phylogenetic relationships or so-called genealogical trees in particular. This poses innumerable questions to the taxonomist, the anatomist, the palaeontologist, etc., but is hardly a subject for heated philosophical controversy. This is somewhat different with respect to the third issue, the question of the causes and factors of evolution.

It appears that it is not so much the general concept of evolution, but certain hypotheses on the causes of evolution which are at the basis of much resentment from the philosophical and theological sides. It may be well to remember that the doctrine of spontaneous generation, of a transition of inorganic material into living organisms, was disposed of only in comparatively recent times, although the idea of a transformation of inanimate stuff into organisms is certainly much more materialistic than the idea of evolution, the transformation of one species of organisms into another. The doctrine mentioned was maintained all through the Middle Ages, and even in the beginning of the 19th century, Goethe still believed that fleas may originate from wood shavings and urine. The theory of the origin of intestinal parasites by way of spontaneous generation was generally accepted until the German zoologist Leuckart discovered the life cycles of tape worms and other such organisms ; and only Pasteur's work in the 1860s repudiated spontaneous generations for the bacteria. The idea of evolution is not a modern invention although, of course, empirical biology is. The Cannon Dorlodot, an authority in patristics,

even claims that, to the end of the 8th century, part of the Fathers of the Church have formally professed the theory of natural evolution of living beings, while no Christian author is known before the scholastic period who would have contradicted it (after Otis, 1950). [1]

Thus, much philosophical argument stems from not distinguishing the principle of evolution from a certain hypothesis about its mechanism. This is the hypothesis known under the somewhat ambiguous name of Darwinism which is, in modern terms, rather generally accepted in the biology of to-day.

In every species we find hereditary variations, called mutations in modern terminology. For example, in the pet of the geneticist, the fruit fly *Drosophila*, some 500 mutations are known which range from trifling minutiae, like shades of eye color or the variation of some bristles, up to deep-reaching alterations, if, for example, a certain mutation has four wings instead of the two characteristic of flies. Mutations are undirected, that is, they show no direct relationship to function, adaptiveness, or environmental conditions. The majority of mutations are disfavorable, and only a comparatively small number may present, generally or under certain environmental conditions, an advantage as to the original form. Furthermore, spontaneous mutations, as well as those that can be induced by outside factors, such as radiation, temperature, or chemical influences, are accidental with respect to external conditions. If, for example, mutations are produced by a raise of temperature, they are in no way adaptive to temperature ; only the rate of mutations, occurring also otherwise, will be increased.

Secondly, there is selection. In any species we find an enormous overproduction of offspring which, however, does not lead to an unrestricted increase of the number of individuals. Mutations may be indifferent, advantageous or disadvantageous. If a mutation is unfavorable, it will soon be eliminated by selection. Favorable ones are preserved, and the individuals possessing them will be more likely to reproduce. Through incessant repetition of this process over long periods of time, it will lead to the evolution of new species and to their progressive adaptation to environment. It can be proved mathematically that a mutation which appears at a very small rate, and even if it presents only a small selective advantage, will become established and will supplant the original form in the course of a comparatively limited number of generations. Mathematical analysis also shows that selection pressure is greatly superior to mutation pressure. That is, even a small selective advantage in a positive or negative way is much more effective than mutation in a certain direction would be without selection. The consequence is that

1. L. Otis, *La doctrine de l'évolution*, T.I, *Un exposé des faits et des hypothèses*, Montréal, 1950.

directiveness of evolution in the sense that it works against selection is all but impossible ; in the sense that it works without selection, it would be effective only over exceedingly long periods of time.

To the factors mentioned, a third is to be added, the so-called drift principle of Sewall Wright. If a species is subdivided into small populations which are isolated from each other, the mere accident of gene-combination can lead to the result that different mutations are established in these populations and regions, irrespective of their selective value. This may lead to the splitting-up of an originally uniform species into different subspecies and finally different species.

Thus, according to current theory, evolution is essentially based upon random mutation, selection, and chance action within small isolated populations. It is this accidental or chance-like character of evolution that has aroused passionate criticism. On the other hand, it is propounded in a dogmatic way which seems unwarranted. Genetical research has been carried through in the last fifty years on some dozens of animal and plant species. It is a basic principle in science to admit only theories that can be proved experimentally. However, it is a rather bold extrapolation to contend that, in two billions or so of the existence of life on our planet, nothing else has happened as what we have seen in two and a half score of years in some dozens of laboratories in America and Europe.

From the standpoint of general biology, the fundamental issue of evolution is not the origin of species, and not even the origin of classes or phyla — it is the origin of organization. A living organism is not a sum total of morphological elements or adaptive characters, but a complex organization whose function depends on the interplay of innumerable parts and partial processes, and where even a slight disturbance may lead to fatal results — witness the fact that the number of lethal mutations much surpasses that of indifferent and advantageous ones. Consequently, the origin of new species, not to speak of higher taxonomic units, means a re-adjustment of organization at almost all levels. Compare two species like mouse and rat which an experimenter has a daily opportunity to observe, and which are rather closely related. Their difference is not merely a matter of those characteristics which are enumerated in a taxonomical key. There are profound differences in the pattern of development and growth, in cellular metabolism, as when, for example, a certain carcinogen may produce tumors in one but not in the other species, in the instinctive and behavioral patterns which presuppose corresponding differences in nerve paths, centers, and hereditary co-ordinations, and so forth *ad infinitum*. Thus it appears that we have to look for evidence with regard to organizational principles and rules characterizing their changes. Admittedly, our knowledge of these organismic laws is in the first beginnings. But it seems that this viewpoint

which I have emphasized for a long time (cf. Bertalanffy, 1952), [1] is gaining ground and the actual evidence concerning it is increasing. In particular, the work of the German zoologist, Rensch (1947), [2] is to be quoted which is closely related to this topic. According to Rensch, neither the organization of the animal body, nor the environmental conditions allow for evolution completely at random, but there are limiting conditions which in many cases act as a direct evolutionary constraint. In this discussion, only a few remarks can be offered as to where such principles may be found.

One possible way is to look for parallelisms in evolutionary changes. Such parallelisms can be observed at three subsequent levels. The first level is that of the genes. It is a well-known fact that many genes and, correspondingly, the mutations they undergo, are homologous in related species, and that there are homologous genes and mutations even in species which are taxonomically rather distant. For example, large regions of the chromosomes are homologous in different drosophila species, such as *Dr. melanogaster* and *virilis*. The same applies to higher taxonomic units. There is a certain gene, called a^+, that causes pigmentation in the flour moth (*Ephestia kuehniella*) by way of a hormone-like substance, known to be a rare amino-acid, kyurenine. In drosophila, there is a gene, v^+, which makes vermilion eyes of a certain mutation to take on the dark red of the wild form, the chemical intermediate being the same. Thus the genes a, albino, in the moth, and v, vermilion eyes in the fruit fly, are homologous, and so are the genes a^+ and v^+, wild type in both species. In this way, species which are widely different taxonomically, such as the flour moth and drosophila, rabbit and man, have certain genes in common, and consequently show parallel mutations. Parallel mutations within smaller or larger groups are a common phenomenon. For example, there are bearded and non-bearded varieties, brittled and firm ears, summer and winter forms to be found within different species of wheat. Again, the genus Rye repeats the series of species found in the genus Wheat. This is the so-called law of homologous series (Vaviloff), expressing that parallel series of mutations may appear in different taxonomical units. As was mentioned earlier, mutations are, in general, undirected. The phenomenon of parallel mutations indicates, however, that genes can undergo mutations in many ways, but not in an infinite number of ways.

A second class of parallelisms is found in variations which are similar phenotypically, but are due to mutations of non-homologous genes. For example, there are albino forms in widely different species,

1. L. von Bertalanffy, *Problems of Life. An Evaluation of Modern Biological Thought*, New York and London, 1952.

2. B. Rensch, *Neuere Probleme der Abstammungslehre*, Stuttgart, 1947.

such as rabbits, mice, cats, humans, and so on. Some of these mutations may be due to mutations of homologous genes ; others to mutations of genes which are different and non-homologous. Parallelisms of this kind are found abundantly in botany, zoology, anthropology, palaeontology, zoogeography, and animal husbandry. Genes interfere in the complicated process that leads from a fertilized ovum to the completed organism. Such interference will be possible in many, but not in an infinite number of ways. For this reason, variations which are identical phenotypically, *i.e.* in their appearance, may arise from mutations of different genes, or may even occur as so-called phenocopies, that is, non-inherited parallel variations due to environmental factors. Developmental conditions seem to impose certain restrictions upon hereditary changes, in particular if the result is to be viable. In other words, possible evolutionary changes will not be completely at random.

Thirdly, there are parallelisms where the genetic as well as the developmental basis is different. There seem to be principles which allow only certain trends in evolution. An often-quoted example is the evolution of the eye. Lens eyes constructed according to the principle of a camera are found in a very similar form in the scallop, the cuttle fish, and the vertebrates. Phylogenetically, these animals are widely different, and so they are embryologically. In invertebrates, the eye is developed from the epidermis, in vertebrates from the brain. Nevertheless, once the way towards a complicated eye is taken, there seems to be no other course than the successive stages of a flat eye, a socket eye, and a lens eye, and thus we find them in the most divergent classes of animals. Simpson (1951) [1] has critisized the argument, pointing out that the parallelisms between the eyes of the octopus and man are only picked-out examples of a great array of photoreceptors that includes almost any conceivable construction. This, of course, is agreed but it does not seem to invalidate the argument ; *viz.*, that the formation of a complex organ like an eye, although tried in different ways, has only one or a few solutions that are technically satisfactory. We may compare this with industrial progress. The early automobiles, as built in 1900 or so by American and German inventors, present the most different forms of awkward carriages. The inherent necessities of construction, however, have led to parallel developments and eventually to a common standard, so that, as far as the essential parts and not the trimming is concerned, there is not much difference between modern cars of different brands, although their « ancestral lines » were different. Something similar seems to apply to basic principles of organization. The evolution of a secondary body cavity, of metamerism, of a circulatory system, etc., is found both in annelids and in chordates ; classes that are antithetic

1. G. G. Simpson, *The Meaning of Evolution*, New Haven, 1951.

in their type, their phylogeny and ontogeny. It appears that there are general laws of organization which allow evolutionary progress only in certain directions.

Thus, a living organism appears not an aggregate of characters accumulated at random, but as being governed by definite laws of the system as a whole. In certain cases, we are able to state these laws in a mathematical way. This is shown most clearly in the consequences of changes in body size which are a common phenomenon in evolution. Usually, although in no way without exception, evolution follows the rule of a progressive increase in body size which can be found in many groups of animals. Increase in body size may, by way of different relative growth of organs, entail far reaching changes in proportion and consequently changes of form. For example, in the human newborn the length of the head is about $\frac{1}{4}$ of the total length of the body ; in the adult, it is only $\frac{1}{8}$. This is a consequence of the fact that the relative growth of the head is less than that of the rest of the body. The reverse is true for the legs which grow relatively faster, and for this reason the adult has relatively longer legs than the newborn. In many cases, relative growth is governed by a simple mathematical expression known as the law of allometric growth (Huxley, 1932). [1] The allometric law applies as well to developmental as to evolutionary changes, as may be seen in two classical examples. In the titanotheres, a family of extinct ungulates of the tertiary period, the earliest forms which were the smallest, did not have any horns. In the species appearing later, horns are developed the size of which progressively increases with increasing body size till they reach monstrous proportions. Thus, the phylogenetic increase of body size is correlated with the increase of the relative size of the horn, this process following a mathematical law. Another classical example is the evolution of the horses, characterized by progressive increase in body size, progressive elongation of the skull, and progressive reduction of the number of toes. The elongation of the skull in the evolution of the horses in relation to body size again follows a simple mathematical law so that it has been said that hundred millions of years of evolution appear to be governed by a simple arithmetic formula.

Such examples illustrate that, in certain cases, it is possible to establish quantitative laws of evolution. The second example shows even something more. The elongation of the horse's skull is connected with important functional and adaptive changes. The relative increase of the preorbital region allows an animal of considerable body size easier to reach the ground for grazing ; it gives space for the large molars, important for a big herbivorous animal. These adaptive changes are intimately connected with the change of pro-

1. J. Huxley, *Problems of Relative Growth*, London, 1932.

portion in the skull and, consequently, with the increase in body size. Thus, changes like those in body size do not affect one character only, but may have complex and partly functional and adaptive consequences. There are a number of factors known which may lead to harmonic transformations : the so-called pleiotropism of the genes, that is the fact that mutations in one gene often influence not a single character, but may lead to correlated transformations in different systems of organs ; regulations in development, where changes in one character may entail adjustments in other systems ; hormones which, controlled by genes, in their turn control the structure and function of the organism as a whole ; the so-called phenomenon of compensation, and so forth. Investigation on these lines is only in the beginning, but it appears obvious that the organism must not be considered as an aggregate of parts accumulated at random, but as a system whose parts are in intimate interaction, and which is governed by definite laws.

Thus it appears that evolution can be considered to be not a series of accidents the course of which is determined only by the change of environments during the history of the earth and the resulting struggle for existence which leads to selection within a chaotic material of mutations. Rather it appears a process essentially co-determined by organismic laws, some of which can be indicated at present, and about which we may hope to learn more in the future.

This, I think, is as far as the scientist can go. His ultimate goal is the establishment of laws which mirror certain relations in the world of phenomena. About the inner essence of things, the ultimate reasons, he is silent. The biologist will be able to penetrate, by way of experiments, into ever deeper and more remote levels of nature ; to establish progressively more refined models to put in order his observations, and to establish laws which characterize certain aspects of the phenomena. He will not unveil, however, the mystery of what is called Life.

LUDWIG VON BERTALANFFY.

Finalistic Evolution or "Teleogenesis"

We have attempted in the following pages to produce a synthesis of what we consider to be the most satisfactory ideas advanced by the various authors who have dealt with the problem of evolution, and have endeavoured to co-ordinate and complete them by new suggestions which our own experience has suggested. It may be felt that we have gone farther than is justified by the facts. However, if we have done so, it has been simply in order to make our own viewpoint clear. As we have asserted in one of our previous works, [1] there are certain ascertained facts which indicate that evolution on a limited scale has occurred. However, there are other facts which although they are not really demonstrative, nevertheless allow us to form a somewhat wider conception. A complete theory of evolution must necessarily take into account all our knowledge on the subject, whether it is certain or only probable, and assemble these various elements, even if they sometimes appear to be contradictory, into a coherent and rational whole. This is the object of this paper. However, we must point out that the ideas presented constitute nothing but a working hypothesis based on our present knowledge of the phenomena of evolution. We shall be satisfied if the data brought together will help our readers to form their own opinions on the matter. — We must point out, to begin with, that evolution is a complex biological process whose manifestations are not determined by a single stimulus acting in a uniform manner, but rather by a system of mutable and sometimes contrasting forces whose combined effect is the equilibrium of the biosphere throughout the geological ages. The failure of many investigators to solve the problem of evolution is quite comprehensible. Desiring to reduce the evolutionary process to the simplest expression, they have taken into account only one factor or only a very few of the factors which have to be considered.

As far as we can judge at present, life probably came into existence in the sea, or at all events, in an aqueous environment, in the form of very simple and perhaps ultramicroscopic micro-organisms produced by the combination of a complex of substances (proteids, glucides, lipoids, phosphatides, cholesterols, etc.) already existing in the colloidal state in the environment. It is quite possible that these primitive organisms did not arise in one point only, but wherever physico-chemical conditions were suitable for their appearance and development. We cannot say at present whether the initial micro-organisms

1. P. Leonardi, *L'Evoluzione dei viventi*, Brescia, 1950.

were of a single type from which all the existing types arose (monogenism) or whether, on the contrary, from the very beginning there were different micro-organisms from which the present types separately developed (polygenism). The theory of monophyletic origin involves some serious difficulties, which have to do in the first place with the marked differences between the principal types of living organisms at the present time and in the absence of actual or fossil transitional forms which connect the various groups. The idea that the first forms of life had their origin in several regions of the earth widely separated one from the other and therefore presenting different environments leads naturally to the polyphyletic hypothesis, since under different local conditions organisms of different constitutions might very naturally arise. Against this hypothesis is the fact that protoplasm, in the organisms which now exist, has a fairly constant chemical composition.

It is probable that the first species of living beings were very similar in appearance, the differences between them, as Rosa has pointed out, being essentially differences in protoplasmic composition such as exist between two eggs of different species or between two bacteria which we can distinguish only by their physiological properties. However, as phylogenetic evolution advanced, the protoplasmic differences began to be revealed in visible bodily characters so that the species, as they succeeded one another, became more and more limited and more strictly specialized for life in certain particular environments.

However, no matter whether we adopt the monophyletic or the polyphyletic hypothesis, we are naturally led to suppose that the primordial organisms were predetermined by their constitutions to development along a certain number of definite lines so that their development did not occur at random, but was co-ordinated from the beginning so as to permit of the existence of animal and plant forms constituting an interdependent and harmonious ensemble.

The gradual execution of this creative " design " is entrusted to a complex of natural forces capable of transforming organisms progressively in certain definite directions depending on the functions allotted to each organic group and to the elements of the group in the general plan of the organic world.

The finality of natural phenomena is evidenced by a vast mass of facts. Evolution also in our opinion is an eminently teleological process. The evolutionary transformations occur, at least to a great extent, according to a preordained plan by means of natural laws.

The attempt recently made by Professor Simpson on the occasion of a " symposium " dedicated to this subject to overthrow the

finalistic view of evolution appears to me to lack objectivity and I find it unconvincing. [1]

We can, it is true, agree that we do not often find evidence for monophyletic orthogenesis. However, I do not think we can regard orthogenetic evolution as a simple straightforward process of progressive development along a single line. We must admit that it includes evolutionary developments which have had the same origin but which have occurred independently, moving indeed toward a common objective which, nevertheless, some lines fail to reach, either because they have been prematurely extinguished or have undergone developments which are either hypertelic or degenerative.

In our opinion, the evolutionary tendency must be regarded as one of the essential properties of living things. This tendency exhibits itself in organisms in an inherent tendency of species to change, that is to say, to bring into existence individuals more or less different from themselves which are in turn capable of transmitting their new characteristics to their offspring. These variations may appear suddenly and may be of considerable amplitude (mutations) or they appear slowly and gradually. In the production of these variations, external factors probably play a considerable part though our understanding of their action is still incomplete.

It has been shown experimentally that mutations arising through spontaneous genetic changes can give rise to new forms and may come into existence under the effect of external agencies such as radiation. But the fact that the radiations which normally occur in nature are incapable of determining such mutations leads us to believe that they are not caused by external agents alone.

Furthermore, the fact that distinct phyla, however closely related they may be, evolve along parallel lines indicates clearly that evolution is a process determined by an internal directive factor common to the phyletic group and not to environmental causes alone.

The frequent cases of orthogenetic development, which obviously correspond to a directed evolutionary process, help to show — whether they rise from mutational processes or not — that the phenomenon of mutation itself is not determined merely by external factors. In our opinion, orthogenetic evolution and adaptation are not explicable by a simple mutational process even if we admit that non-adaptive mutations may have been retained and developed by natural selection.

The existence of adaptation and of adaptive orthogenetic evolution under the influence of the environment and therefore of external factors can be reconciled with the non-adaptability of mutations, demonstrated by experiment, only when we assume that the process of mutation is, at least in some cases, under the control of self-regulatory mechanism existing in organisms and comparable with the mechanism

1. G. G. Simpson, in *Paléontologie et transformisme*, Paris, 1950, pp.123-163.

that exists in individual organs. Considering the matter from this standpoint, it appears that there is no incompatibility between the old concept of adaptation and the mutationist concept of preadaptation.

In our view, preadaptation can only be the result of a predisposition in organisms so that they react to environmental variations in certain directions so as to ensure the survival of the race.

The innate self-regulatory power which we believe to exist in organisms produces, under certain conditions, mutations among which only the advantageous types continue to exist owing to the effect of natural selection. In this way, there arise forms different from the original ancestor but progressively better fitted to the new environment. If changes in environmental conditions are abrupt, the mutational changes may be discontinuous but we may also regard them as continuous, having in some sense a relation to future necessities.

One of the most clear and interesting results of modern palaeontological work is that when new morphological types arise, there immediately occurs an adaptive irradiation with the production of a great number of forms belonging to the same type. The bush-like form of geological trees, as modern geologists have worked them out, is a result of this phenomenon.

In fact very few of the divergent branches survive very long. Most of them become extinct in a short time. Only those survive which are potentially capable of producing descendants able to adapt themselves to the environmental changes. [1]

The transmissibility of acquired characters produced either by environmental factors or through use and disuse has not been experimentally proved. Hence the evolutionary process, which cannot be satisfactorily explained on mutational theories, is still without an experimental basis. Some authors think, of course, that the environmental factors, acting on the somatic part of the organisms, can nevertheless influence the germ plasm (for example the cytoplasm of the female germ cells) by means of internal secretions (Fraipont).

In any case external factors cannot in our view really be the cause of a variation but rather determine its appearance by a kind of catalytic action. In other words, they unleash the evolutionary energies which are latent in the genetic patrimony of each organism when a change in environmental conditions demands an adaptive change or the re-establishment of a different biological equilibrium.

The importance of external factors in determining the extinction of organisms appears particularly obvious. I agree with Arambourg that the most common cause of extinction (though not the only one) is that a certain environmental change necessitates in the organism

1. G. Arambourg, in *Paléontologie et transformisme*, Paris, 1950, p.95.

a mutation produced more rapidly than is possible, or in an impossible direction. [1] It is not, I think, a simple coincidence that the great mutations of the fauna occurred in connection with the great geodymamic phenomena such as the elevation of mountains or the transgressions and regressions. [2] Nevertheless, these environmental factors or changes in environmental factors produced the extinction of organisms only when their genetic constitution had altered so that they had lost the evolutionary potential necessary to produce the adaptive mutations required.

We must note that evolution can be either progressive or regressive according to whether it brings about either the development or the reduction of an organ or of a complex of organs. Nevertheless, it must be pointed out that the terms just used have only a relative value because the reduction of an organ may be useful to the organism as a whole (as for example in the case of the reduction of the lateral digits in horses [*genus Equus*]) and thus may contribute to the progressive evolution of a biological entity.

On the other hand, we can recognize regressive evolution in the absolute sense when it results in the degeneration of a species or of larger systematic group as a result of a temporary crisis or, more frequently, as a prelude to extinction (for example in the degenerative forms of the cretaceous ammonites and the small elephants of the Pleistocene in the Mediterranean islands).

Every specific entity may be considered as a combination of gene complexes. Each of these determines a certain morphological feature and is in a condition of discontinuous evolutionary change either progressive or regressive. Every gene complex and consequently every character dependent on the complex appears to possess an individuality of its own and to be to a certain extent independent, in the sense that every complex and every morphological or physiological character deriving from it may follow its own evolutionary course, while other complexes and characters appertaining to the same specific entity may remain unchanged or evolve along lines of their own. This is a modification of Osborn's law of the variation of single characters.

If we consider any phyletic group, particularly among those where orthogenesis occurs (for example the case of the horses or of the titanotheres) we find that in every one of them some morphological feature undergoes a progressive transformation (size, skull protuberances, teeth, etc.) while others regress (lateral digits) or remain unchanged. However, we do not think it is possible to speak of a complete independence of a character with respect to the evolutionary process because single characters are not biological entities existing

1. In *Paléontologie et transformisme*, Paris, 1950, p.118.
2. *Ibid.*, p.108.

by themselves but coexist so as to constitute an organic whole. We think that in every species the evolutionary processes corresponding to the single characters proceed harmoniously at least in the progressive stage of development, that it is only in the terminal and regressive stage that we find independent and inharmonius developments which contribute to degeneration and extinction which we may regard as a symptom of the ageing of the species.

In the present stage of genetics, the mechanism of evolution is not yet well understood. However, the geneticists incline to the view that the data on variation provided by experimental genetics indicate that there is no real contradiction between genetics and evolutionary theory and it is possible to reconcile the idea of evolution by means of successive mutations and the almost absolute stability that the species exhibits in the intervals between mutations.

The present view is that the variations are primarily [1] due to mutation and to chromosomic reconstructions and that the derivative forms coexist *ab initio* — in a condition of unstable equilibrium — with the normal individuals (resembling the progenitors). In this way there are produced polymorphic populations on which, during the period of adaptive irradiation, natural selection exerts its effect (A. C. Blanc).

Certain conditions are necessary if a variation is to produce a new race (and eventually a new species) without being eliminated by a natural selection in the crossing over with the more numerous individuals of the typical primitive form (Romanes). The variation must appear about the same time and with a certain constancy in several individuals or some particular environmental or physiological condition must favour these individuals. Studies of the changes in the structure and number of chromosomes have revealed several possible mechanisms which may produce partial or even total separation of stocks (Buzzati-Traverso, Jucci, Timofeeff-Ressowsky).

If natural selection is favourable to the new forms, an equilibrium between these and the original progenitors will be established. However, this equilibrium will be rather unstable and as result there will be fluctuations involving the competitive forms (Timofeeff-Ressowsky's vital waves). The selection of the elements which constitute these polymorphous populations will have as a result the segregation of

1. But not exclusively. According to some authors, these are not even the predominant causes of evolution. See for example the remarks of A. Vandel (*L'homme et l'évolution*) about cytoplasmatic heredity. In the opinion of Vandel, the Mendelian laws of inheritance and the mutations of chromosomes have to do with only the most evolved organisms which have therefore already attained a certain stability. "It is likely," says Vandel, "that originally the distribution of the heredity factors occurred through a cytoplasmatic process which was connected with the distribution of organo-formative substances in the blastomeres resulting from the division of the egg."

more distinct and more specialized populations of elements which coexisted in the starting populations (A. C. Blanc).

At the beginning and for a certain number of generations, the typical form and the derivative forms will be fertile *inter se* and therefore these derivative forms will be only races of the mother species. At this stage the evolutionary processes are reversible ; crossing which will produce a secondary polymorphism is possible either artificially or naturally (when the environmental conditions which operate it to produce segregation have ceased to act) (A. C. Blanc).

However, eventually it may happen that the mother species in some of the derivative forms which differ more and more from it attain a point where mating is no longer possible (at least with positive results) under natural conditions, either because the difference in morphology is too great or because there is a physiological incompatibility (the cause of which is still uncertain). When this stage is reached, the evolutionary process becomes irreversible and the new features are definitely established.

A study of the evolutionary processes during the geological period seems to indicate clearly enough that every organism or group of organisms normally exhibits a plasticity in its initial stages and subsequently a polymorphism which is more marked than it is in later periods of its history.

Specialization and adaptation seem to be in inverse ratio to the evolutionary potentiality in the species or in the group. The more specialized an organism or a phylum is, the more strictly limited will be the transformations that it can undergo. For this reason, only the organisms which retained generalized characters were able to advance toward higher degrees of organization, while the others which branched off from the principal generalized stock and specialized in various directions retained only the relatively slight evolutionary capacity which allowed them to adapt themselves to a certain definite environment or to a certain definite function in the equilibrium of the biosphere.

It should not however be imagined that when certain characters have attained a stable condition corresponding to the origin of a new species, the species has for that reason become completely and definitely stable. In our view, it has become stable only because the characters which differentiate it from the other species and other similar species have become part of the genetic constitution but in other respects it retains its capacity to evolve. If an opportunity occurs, it can under the influence of internal or external stimuli change either gradually and imperceptibly or suddenly and resume evolution after a static period, remaining either in the field of the species (as for example when the external agents are the predominant factors and

variations are limited and gradual) or producing by mutation new polymorphic populations on which the selective process will act so that additional new species will be created.

Recent studies in the field of experimental genetics permit us to say that the evolutionary process can extend beyond the limits of natural species from a physiological standpoint but it does not appear that they can go beyond the frontiers of the genus. For this reason, some authors accept micro-evolution but not macro-evolution though good support for this phenomenon can be found in the palaeontological data. In our view, the results obtained by genetic experiments do not demonstrate conclusively that only mutations of the kind we obtain in the laboratory and nature have been responsible for evolution. We think that the time factor has been too little appreciated and often neglected by biologists. It appears to us that in the geological past, evolution occurred with more important transformations, transcending the limits of the genus. Since we must admit that certain new and particularly complex organs can hardly be conceived as having come into being by an accumulation of slight variations (since in some cases the rudiments of organs such as wings would have been more harmful than useful), investigators assume that in past epochs mutations have been very much more important than those which have been produced experimentally. Among the biologists, there are some who believe that at the present time the intense evolution which occurred in the geological past has been replaced by a relative stability. We cannot see the necessity or even the probability of this view, especially if we consider the undoubted evolution of mankind from its oldest to its most modern representative. However, the attainment of a stable condition might be regarded as reasonable if we assume that the final aim of the evolutionary process was the creation of the human body and of an environment in which this creation could occur.

In our opinion, organisms would advance owing to an inner stimulus to a higher and higher level, culminating in the appearance of man and through such stimuli they would be led to co-operate in maintaining the equilibrium of the biosphere necessary for the perpetuation of life.

Indeed, if we admit that all animals and plants descend from a single original, neutral organism (monogenism), all the great groups of living beings (or most of them) would have played a part directly or through their ancestors in the phylogenetic process which culminates in man and in maintaining the equilibrium necessary to life. If on the contrary, as seems more probable, or at least more in conformity with our present knowledge, the principal types of organisms descend from forms distinguished *ab initio* (polygenism), only the vertebrates and the organisms from which they descended would have had a part in producing the human body while all the others, animals and

plants, would have co-operated in maintaining the equilibrium of the biosphere throughout the geological ages.

The inherent tendency in any organism to move toward a higher level of organization may be in our view either facilitated or blocked (or at least delayed) by environmental conditions (favourable or unfavourable climatic conditions, predominance of more powerful organisms, etc.) which — as above stated — do not actually cause variations but act rather as catalysers in the evolutionary process and contribute up to a certain point to the direction of evolution. When we realize this, we can understand that a process of this kind is not necessarily continuous but that on the contrary periods of intense variability may alternate with long periods of relative or total stability (Eimer's Epistasis). [1]

Among the factors which contribute to revive the evolutionary drive, we must mention the building up of new energies owing to the effect of a new environment after the migration of a phylum which is not yet excessively specialized.

A similar result may be produced by environmental factors in those evolutionary processes which are directed to the maintenance of biological balance.

When any environmental factors seriously interfere with the biological balance, the evolutionary drive of the organism is awakened and rapid and important evolutionary processes result. These processes can produce (in a longer or shorter time) a new equilibrium between the various evolving organisms and between these organisms and the environment.

To us it appears that just as every organism and every organ has a self-regulatory power by means of which its normal condition is re-established after it has been disturbed, so in the biosphere (by which we mean the complex of interdependent organisms) we have to a great extent the same self-regulatory mechanism which maintains throughout the ages an equilibrium favourable to life.

The biological cycle of every group of living beings can be represented, in our view, by a parabolic curve : this curve rises at first rapidly in a manner which corresponds primarily to the strength of its inherent evolutionary drive and, secondarily, to the environmental circumstances, until it reaches its highest point, which corresponds to the optimum for that particular group. After reaching this point, the animal or plant group reaches a stage of decline and proceeds towards a more or less rapid extinction, sometimes preceded by a stable period. The disappearance of many more or less important

1. In agreement with this is the fact that some groups of organisms (and sometimes several groups at the same time) have failed to change and then have passed into a phase of rapid evolution. A case of this kind is the simultaneous evolution (outbreak) of mammals and birds which followed a long period of very slow and unimportant evolution.

groups of organisms that has occurred during the geological past can be better explained if we attribute it to internal causes than as a result of environmental conditions which have probably merely assisted a predetermined process. Indeed in many cases it has been determined that the extinction of a group of organisms was preceded by clear signs of degeneration. An example of this is found in the exaggerated gigantism and the degenerative features in the most recent dinosaurs and the irregularity in the coiling of the shell in the cretaceous ammonites. On the other hand, the fact that these and other groups of organisms became extinct at the same time toward the end of the mesozoic era seems to show that environmental facts also contributed to their decline.

The conflict between the internal evolutionary drive of the organism or group of organisms and the effect of environmental factors has of course the effect that the curve representing its biological cycle is discontinuous and shows irregularities which may be regarded as the resultants of the two interacting elements.

To us it appears probable that many groups of animals and plants attained the summit of their developmental cycle, having fulfilled their function either with regard to the development of the human phylum or with regard to the preservation of the biological balance. After this point they entered a degenerative stage (regressive evolution) which is a symptom of their eventual extinction. In other cases on the contrary, it appears that certain species or indeed certain more or less extensive groups of organisms, which have either not fulfilled their functions or have never become specialized to very precise environmental conditions, have persisted indefinitely without alteration from remote periods until the present time. [1] This prolonged stability which is so disconcerting at first sight can be well understood in the case of many organisms whose existence is necessary to the balance of the biosphere. Looking at the matter from this standpoint, we can understand how neither external nor internal agents have been able to induce the protozoa which still exist at the present time to advance toward a higher degree of organization in spite of the passage of an immense period of geological time from the Algonkian era until the present day.

The progress of biological studies shows more and more conclusively that the different organisms which belong to the same morphological type are not independent and that the extinction of one group and sometimes even of a single species can determine the disappearance of other species or groups of species even among the higher organisms and thus produce very remarkable disturbances in the equilibrium of the biosphere. This interdependence of organisms

1. This is typical of *Lingula, Nautilus* and many other organisms which are called *panchronic* because of their persistence throughout the geological time.

is exhibited also in the order of the appearance of the great groups in the geological ages. For example in the uppermiddle Jurassic period the angiosperm-phanerogamic plants appeared at the same time as the Hymenoptera and the Lepidoptera whose existence is intimately connected with that of the flowering plants.

It is thus logical to assume that the evolution of individual organisms, even though it is directed toward the attainment of the highest degree of organization is, on the other hand, subordinate to the preservation of the balance of the biosphere. Neither the higher plants nor the animals and much less the mammals could survive at the present time without the existence of myriads of lower organisms whose activity is necessary to their existence.

This explains why the evolutionary processes attained great amplitude only in certain organisms predestined to attain the higher levels of organization while in others involved in the evolution of the environment, only limited transformation occurs. Others became stable when their role was the maintenance of conditions necessary for the existence and development of the highest organisms, which can survive only in the presence of others in an inferior stage of organization. We can understand these phenomena only if we realize that the various primordial organisms (in the polygenetic hypothesis) or each of the branches derived from the original single ancestral organism (in the monogenetic hypothesis) had already *ab initio* a well determined biological destiny prefigured, so to speak, in its constitution and that evolution has occurred in each of the various types within the limits allotted to it as regard to nature as a whole. To us it seems probable that in the maintenance of each group of organisms and in the determination of its biological destiny environmental factors also have played a part which though it appears to us as a complex of chemico-physical phenomena acting at random according to the laws of probability, constitute, nevertheless, a causative agency which contributes, together with the internal evolutionary stimulus, to the progressive actuation — according to natural laws — of a creative design.

It seems now advisable to examine the problem of the origin of the human body which, owing to its connection with extra-scientific problems, is particularly delicate. The solution of this problem involves very serious difficulties but to complete my survey of evolutionary phenomena I think I should attempt to offer a personal interpretation in which the ideas we have now acquired are completed and placed in a setting of wider concepts.

We must of course stress the fact, which we have already mentioned, with regard to biological evolution in general, that what we are offering is nothing more than an absolutely provisional working hypothesis by which we are simply attempting to co-ordinate and

explain the facts which, as we know, sometimes appear to be contradictory.

The first fact we have to remember is that man presents many primitive features, not only with regard to numerous living Anthropoids more specialized than he is, but also with respect to many other mammals. Among these features, we have to remember the five fingered hands and feet, the complete set of teeth, the quadritubercular grinding teeth and the unspecialized digestive apparatus. Man's skull is much more similar, morphologically speaking, to the skull of the young anthropoid than to that of the adult anthropoid. In fact both in the human skull and in the young of the anthropoid, there is a remarkable development of the cerebral region, a deficiency in the bony arches over the yes and of the median crest. The face and the mandibles are reduced, the masticating muscles and the eye-teeth are feebly developed. These features become gradually modified in the anthropoids as they grow older. In other respects also, the human body is more similar to the young of the anthropoid than to the adult. For example among the white races pigmentation is very slight (the anthropoids and the coloured human races are lighter at birth than later in life), the disappearance or reduction of the hairy covering (the hairy covering of the Gorilla and the chimpanzee is at birth only on the head). On the basis of these facts and many others which it would be too long even to summarize, we may think with many great palaeontologists and anatomists of the possibility that a sudden genetic mutation of an anthropoid — living at the end of the Pliocene or at the beginning of the Pleistocene — produced a first human neotenic form which retained in the grown-up the immature features of a poorly specialized mother form. From this human form having generalized and synthetic characters and thus able to generate all the extinct and living human races, a polymorphic and heterogeneous population took its origin. In this population the native synthetic form and some new ones arising from later mutations coexisted. Some of these persisted or regressed having distinctly pithecoid characters and others neotenic and progressive characters more and more similar to present man.

A certain number of lines developing by parallel evolution arise from this polymorphic population by process of segregation. These we can group in three phyletic complexes.

a) A complex having synthetic characters analogous to those of the native form under which the last known representatives are, in my opinion, some races having mixed characters in the middle Pleistocene (e.g. Palestine man).

b) Another complex (it might be derived directly from the native polymorphic population detached from the first group at a certain moment of its evolution) having more or less well marked pithecoid characters in which we can observe progressive evolution toward the

human form and also in certain races a more or less stable condition persisting until relatively recent times (man of Solo) or a true degenerative regression which, starting from moderately theroid forms like the Protoneanderthalians (Steinheim), the man of Gibraltar and of Saccopastore, reaches at the end of the middle Paleolithic in Europe (La Chapelle, Circeo) perhaps in more recent times in Africa (Rhodesia) a degenerate condition.

c) A complex with characters which approach more and more nearly to those of present man. This took its origin in the lower Paleolithic in forms such as the Swanscombe and the Fontéchevade man includes all the ancient and modern races of *Homo sapiens.*

Among the three complexes, the limits and affinities of which are very difficult to define, single hybrids probably existed ; only the last one (*Homo sapiens*) is still living, while the races corresponding to the other two complexes disappeared more or less rapidly through the geological ages or perhaps united with *Homo sapiens,* thus losing their individuality. By this interpretation — which has been very inadequately sketched and which would require a much more profound study than we can make with the insufficient data we possess at present — it seems possible to me to conciliate both the monogenetic origin of mankind and the known coexistence of already differentiated human types in the ancient Paleolithic.

Following what we have remarked at the beginning, it may be that in the view of some of our readers our conception which — we repeat — is simply a working hypothesis — and nothing more — presents in its more speculative aspects some extra-scientific elements since many scientists now claim that scientific statements can contain only what emerges directly from experimental research. Indeed the reality of some of the fundamental concepts of our theory, such as the one of the finality in nature and the co-ordination of all the evolutionary processes in order to attain in the end the formation of the human body and the equilibrium of the biological environment — cannot be proved by entirely experimental principles. We take the liberty of referring to the statement of Charles Darwin about his hypothesis of natural selection — that the strongest argument in its favour was not so much the many facts brought in support of his assertion but the discovery that several problems until then unsolved found in it the most logical explanation. And if it is true that the Darwinian hypothesis is not sufficient to explain the complicated phenomenon of evolution, there are not many today who refuse to admit natural selection as one of the factors of evolution.

Certainly we do not intend to compare our very unassuming paper with a work of genius such as *The Origin of Species* which opened a new era in the history of the knowledge of nature. We refer to Darwin's words only because in our case also it appears to us that our hypothesis gives a reasonable explanation of some problems

which have not even been faced or which have been solved only partly by preceding theories. In its general aspect, it presents a fairly complete and harmonious picture of the complex phenomenon of evolution discovered up to the present time so that anyone who studies nature free from materialistic preconceptions can find satisfaction in it. We think this fact is in favour of our concept. However, we do not intend by any means to give it the value of a final theory which is free from lacunae and errors.

The way to the truth is still long and hard and we will be satisfied if our attempt may constitute another step toward the ultimate objective, or at least if it gives a starting point for new investigations and broader perspectives to readers, whether their attitude is favourable or unfavourable.

PIERO LEONARDI.

La succession des êtres vivants aux temps géologiques

ÉVOLUTIONNISME ET PALÉONTOLOGIE

La théorie de l'Évolution des êtres vivants est sous-jacente dans l'examen et la discussion de la plupart des problèmes biologiques. Aussi bien, à l'heure présente, les recherches portent-elles sur le mécanisme de l'Évolution, tant il semble assuré, parmi les Naturalistes, que le développement évolutif des séries vivantes, animaux et plantes, soit acquis : les espèces descendent les unes des autres, elles se diversifient de génération en génération, des transformations s'accomplissent qui se produisent dans une direction déterminée ; une ligne d'évolution générale se manifeste pour l'ensemble des végétaux, l'ensemble des animaux et l'homme.

Hypothèse de travail qu'aucune autre n'a surclassée pour les Naturalistes, depuis qu'elle fut formulée par les Lamarck, les Darwin, parmi les plus célèbres de ses auteurs. Elle a éclairé et guidé, depuis plus d'un siècle, la plupart des recherches d'anatomie comparée, d'embryologie. Dans l'ordre de la pensée, elle a permis de relier entre eux les groupes des êtres vivants, d'en éclairer, d'en déceler les dépendances, les parentés, les variations et d'en déchiffrer toutes les diversités. Dans ce domaine, la synthèse évolutionniste paraît de toute évidence supérieure à la conception fixiste. Aussi les Naturalistes — les Paléontologistes aussi bien que les Biologistes — sont-ils tous acquis à l'idée d'évolution. Ils l'acceptent comme un principe, un postulat, une loi, cette variété dans les termes indiquant seulement des nuances dans la pensée ou traduisant des différences dans les conceptions philosophiques. Tous s'y rallient comme à l'approximation la plus satisfaisante de la réalité, et tous s'en servent.

Mais encore faut-il contrôler la théorie avant d'admettre qu'elle représente la vérité, ou nous mette simplement sur la voie. Or, là surtout, la preuve historique est la seule qui soit péremptoire : les études géologiques vérifient-elles ou non les affirmations évolutionnistes ? Perçoit-on, à travers les âges, cette continuité d'une progression dans les lignées d'êtres vivants qui, depuis le commencement des temps primaires, se sont succédé à la surface du globe, sur les terres émergées comme dans les Océans ?

Eh bien oui. L'une des plus solides démonstrations qu'apporte la Paléontologie, l'étude des fossiles, leur succession dans les terrains permet d'affirmer que les êtres qui se sont succédé ont marqué dans chaque groupe et dans l'ensemble une organisation de plus en plus

complexe, des appareils, des systèmes où les fonctions sont de mieux en mieux localisées, où la division du travail est de plus en plus poussée.

Cet exposé comprend trois parties :

Première partie. — Montrer que les plantes d'abord, les animaux ensuite, que les groupes se sont relayés par paliers successifs, chaque série marquant un progrès sur la précédente.

Deuxième partie. — Ces groupes dont l'enchaînement est si manifeste sont-ils sortis les uns des autres ? Cette conception est-elle démontrable ? Par la Paléontologie, non. La Biologie s'y est essayée ; c'est à quoi répondent les théories : Darwinisme — Lamarckisme — Mutationnisme.

Troisième partie. — Faits paléontologiques, théories biologiques — nous sommes toujours dans le domaine scientifique (celui de l'Évolution scientifique) —, de celles-ci et de ceux-là nous verrons ce que la Philosophie tire pour formuler des propositions générales et construire des systèmes, notamment celui de l'Évolutionnisme intégral.

I. LES PALIERS SUCCESSIFS

1) *Le monde végétal (Paléobotanique)* [1]

Permettez-moi de rappeler sommairement ce qu'apprend l'étude des végétaux actuels, la classification qui en a été établie, du simple au complexe — celle que l'on trouve dans tous les ouvrages de Botanique, même élémentaires.

À la base, les végétaux dépourvus de graine et de fleur, les Cryptogames ; algues, champignons, simples filaments ou amas cellulaires, sans autres différenciations d'organes, — mousses avec tiges et feuilles — prêles, fougères avec appareil végétatif complet : racines, tiges, feuilles, et surtout un système interne de vaisseaux, qui sont les voies et moyens de distribution des sèves entre tous les étages de la plante.

Puis, l'embranchement supérieur, les Phanérogames, plantes à fleurs ou à graines, qui comprend les Gymnospermes : cycas, gingko, pins : les graines sont nues à la surface des carpelles ; enfin, tout au sommet, les Angiospermes, à fleurs hautement organisées avec enveloppes florales encadrant des carpelles dont les bords reployés enferment les ovules et les graines.

L'ensemble marque un progrès, un enrichissement (évolution) continu depuis les plus simples des plantes à spores (Algues) jusqu'à l'épanouissement de la fleur d'angiosperme.

1. J'ai utilisé et résumé ici le travail de M. A. Carpentier : *La vie des plantes au cours des âges géologiques* dans *Mélanges de science religieuse*, 7e année, n.1, pp.109-131, Lille, 1950.

Or, l'histoire du développement de la flore à travers les âges géologiques retrace, dans le temps, la succession de ces formes ; cette histoire nous donne donc l'image d'une évolution progressive.

Les végétaux ont-ils apparu les premiers, avant les animaux, on l'ignore — les origines de la vie étant marquées par la transformation profonde des plus anciennes formations géologiques partiellement ou totalement recristallisées — mais dès qu'il y a trace de vie, animaux et végétaux existent ensemble.

Au Cambrien ne sont connues que des Algues, déjà diversifiées d'ailleurs. Au Silurien supérieur et au Dévonien inférieur et moyen, les premières flores terrestres peuplèrent les rivages et les terres émergées ; c'étaient des Ptéridophytes très simples, à rapprocher des Prêles et des Fougères. Au Dévonien supérieur et au Carbonifère se multiplient les plantes à graines ; Gymnospermes inférieures ayant leurs affinités avec ce qui nous reste des Cycadées. Au Secondaire, une grande variété de Gymnospermes : celles-ci atteignent à cette époque un luxe de groupes, de familles, de genres, dont notre monde actuel a gardé seulement quelques témoins : les conifères se diversifient alors. À la fin du Secondaire, les Angiospermes prirent possession à leur tour des terres émergées, et au Tertiaire se développent à profusion et descendent des régions arctiques et tempérées vers les zones de basse latitude ; on assiste à la migration des flores arctiques de l'Éocène au Pliocène et au Quaternaire vers la Méditerranée et les Tropiques.

Avant de passer à des exemples pris dans le monde animal, je voudrais marquer quel travail intellectuel s'effectue sur ces données : d'une part, toutes les plantes actuelles classées dans un tableau où elles s'ordonnent du simple au complexe, des algues aux plantes à fleurs ; d'autre part, leur apparition au cours des temps géologiques, précisément dans le même ordre de complication et d'enrichissement. L'esprit qui travaille sur ces données de fait en tire la conclusion : les formes les plus complexes sont sorties des plus simples ; nous sommes en présence d'une lignée dont l'ordre merveilleux est le résultat d'une évolution progressive au cours des temps géologiques ; d'une plante élémentaire sont sortis des rameaux qui se sont multipliés et finalement ont constitué tous ensemble un grand arbre.

La Paléontologie, en tant que science de faits, ne vérifie pas ces inductions légitimes de l'esprit, disons celles du penseur, du philosophe ; elle les utilise toutefois et nous verrons de quelle manière.

Elle ne les vérifie pas. Ainsi les Angiospermes apparaissent sans que l'on connaisse et puisse préciser quels sont leurs ascendants, car elles apparaissent soudainement. Les plus anciennement connues se trouvent dans le Crétacé inférieur du Groenland, et en Sibérie occidentale près de Vladivostock sur la côte nord du Pacifique (Sakhalin). Il s'agit donc là d'un groupe ou phylum, qui apparaît à la fois distinct par son organisation et par son habitat périarctique d'où il gagne

ensuite les moyennes et basses latitudes. Il en est de même pour les premières Gymnospermes à affinités de Cycadées au Carbonifère ; et pour les Conifères chez les Gymnospermes d'organisation plus élevée ; autant de phylums distincts qu'on ne peut jusqu'à présent relier les uns aux autres. Les lignées se sont développées suivant un plan général, mais ce développement s'opère suivant des lignes séparées parfois parallèles, parfois chevauchant les unes sur les autres.

Les grands groupes se sont succédé, ont réalisé chacun leur épanouissement, indépendamment, à une certaine date des temps géologiques ; le groupe dominant d'une époque peut très bien n'avoir pas d'affinité directe avec celui qui le remplace (ainsi Gymnospermes et Dicotylédones). Si l'on veut une comparaison appropriée : les branches principales ne donnent pas l'impression de celles d'un chêne mais plutôt d'un peuplier d'Italie dont les rameaux font un angle aigu avec le corps de l'arbre ; les rameaux plongent longuement, presque parallèles, vers une souche profonde et mystérieuse.

Mais c'est ici que l'hypothèse devient féconde. Car s'il y a filiation, comme on a le droit de le supposer, la date d'apparition connue par documents certains n'est qu'apparente, et il faut toujours chercher plus loin dans le passé la véritable origine des phylums. Deux exemples : les Ptéridophytes les plus simples du Dévonien moyen, les Rhynia (Écosse) ne constituent pas les toutes premières plantes terrestres connues, elles supposent des ancêtres plus lointains dans le Prédévonien. De même la découverte de Ptéridophytes plus évoluées dans le Silurien d'Australie autorise à rechercher plus bas dans la série des terrains primaires les ancêtres des premières flores terrestres — dans le Cambrien et peut-être le Précambrien.

À propos du monde des plantes, j'ai voulu ainsi fixer les positions : la succession dans l'apparition des groupes, ceux-ci en progression les uns sur les autres ; l'hypothèse de la descendance, de la filiation entre eux (entre les phylums), comment elle est corrigée ou mise au point par les découvertes.

Nous verrons maintenant que tout ceci est confirmé, et renforcé, dans les résultats obtenus en Paléontologie animale.

2) *Le monde animal*

Les plus anciennes faunes connues, celles du Cambrien, sont caractérisées déjà par la variété inattendue des Embranchements et des Groupes : Protozoaires, Spongiaires, Hydrozoaires, Échinodermes, Brachiopodes, Mollusques de plusieurs ordres, Crustacés, ces derniers représentés non seulement par des séries encore existantes dans la faune actuelle, mais par des groupes totalement éteints, depuis la fin du Primaire, celui des Trilobites, par exemple. Mais aucun Vertébré n'est connu dans les faunes cambriennes ; pas de reptiles, ni de poissons.

Il semble donc que les Invertébrés ont précédé dans le temps les Vertébrés, ces derniers dotés d'une organisation bien plus complexe, avec une différenciation des appareils qui traduit une division du travail et une séparation des fonctions mieux assurées à mesure que l'on s'élève dans la série. Les premiers Vertébrés, des Poissons, n'apparaissent qu'au Silurien supérieur et au Dévonien inférieur. Puis les premiers Reptiles qui, apparus au Dévonien également, prennent leur épanouissement avec les premiers Amphibiens au Dévonien, au Carbonifère et au Permien. L'apogée des Reptiles est au Secondaire, époque où les Mammifères font seulement leur apparition, leurs représentants y demeurant d'ailleurs limités à des groupes inférieurs qui ont leurs affinités avec les Marsupiaux et les Insectivores actuels mais peu différenciés. Au Tertiaire, brusquement, les Mammifères prennent leur essor et dominent un monde où les Reptiles ne sont plus représentés que par quelques groupes aux formes très spécialisées comme les serpents, les tortues, ou de taille réduite comme les lézards. La prédominance des Reptiles depuis la fin du Primaire et au Secondaire était marquée par une extraordinaire diversité des groupes. Il y eut des Reptiles nageurs, en eaux douces, en eaux marines, autant que des Reptiles terrestres vivant en marécages ou cheminant à la surface du sol. Il y avait des herbivores, d'autres étaient carnassiers ; parmi ceux-ci quelques-uns étaient munis de canines formidables, en lame de sabre ; tels Scylacosaurus du Permien de l'Afrique australe et Inostranzevia du Permien de la Kama en Russie, pareils en cela aux grands Tigres du Pliocène et du Quaternaire. D'autres Reptiles au Jurassique supérieur et au Crétacé étaient adaptés au vol à l'aide de membranes tendues entre les doigts du membre antérieur et capables de s'étaler en éventail comme une voile (dispositif réalisé chez les chauves-souris parmi les Mammifères). Autre signe d'apogée dans le développement d'un groupe : des maxima de taille. Certains Reptiles atteignent au Secondaire des dimensions jamais connues jusque-là chez des animaux : de 15 à 20, voire 30 mètres chez le Diplodocus (comme chez les Baleines actuelles). Dans les nomenclatures, les noms des Dinosauriens, ceux de Brontosaurus, Tyrannosaurus, traduisent le fait qu'ils étaient alors les rois de la création à la fois par leur masse et par toute leur armature d'attaque ou de défense.

Au Tertiaire, tout cela s'efface en quelque manière. De ce rameau si puissant et si richement diversifié, il ne reste dans le monde présent rappelant ces grands Reptiles que les Crocodiliens ; encore sont-ils confinés dans un milieu tout de même limité, les eaux ou les bassins de quelques grands fleuves équatoriaux et tropicaux d'Amérique et d'Afrique.

Ils ont été relayés par les Mammifères. À leur tour, ceux-ci ont revêtu une richesse de formes que nous constatons mais dont nous eussions été impuissants, disons-le, à imaginer le nombre, la variété,

les groupes fossiles venant combler les intervalles et les vides de nos classifications.

De cette profusion de familles, de genres et d'espèces, comme du merveilleux et constant progrès dans leur organisation, Gaudry présentait il y a un demi-siècle déjà un magnifique tableau d'ensemble dans ses *Enchaînements du Monde animal*, aujourd'hui trop oubliés ou trop peu lus.

Un exemple classique, je ne fais que le rappeler ici, est sorti de ses travaux comme de ceux de Cuvier ; c'est la phylogénie des Équidés, dont l'élément principal est l'évolution du membre, partant d'un Ongulé à cinq doigts dont un déjà réduit à l'Éocène supérieur et à l'Oligocène, les deux latéraux amenuisés et devenus organes-témoins au Miocène moyen, pour ne plus laisser place chez le cheval du Quaternaire et des temps actuels qu'au doigt médian unique, puissant, capable de porter tout le poids du corps dans un galop rapide.

Des êtres aussi spécialisés que les Rhinocéros sont aujourd'hui, toujours chez les Ongulés, les derniers témoins, raréfiés comme familles et comme genres, d'un groupe richement diversifié à l'Oligocène et au Miocène, et qui comprit alors de gros animaux, dont l'évolution s'effectue en Asie et en Amérique du nord ; le nom de Titanothériens qui leur a été appliqué dit assez quelle fut leur masse et quelle dut être leur puissance.

Un autre ordre représenté par des êtres qui, dans notre monde, jouent un rôle effacé, s'il en fut, celui des Édentés, comprenait au Tertiaire et au Quaternaire ancien, en Amérique du sud principalement, des êtres comme le Megatherium qui atteignait 4 m. 50, et ces singuliers Glyptodons de 2 à 4 mètres, dont la carapace était assez grande pour qu'un homme pût y trouver abri. Tous ces êtres ont aujourd'hui disparu, remplacés dans notre monde par de petits animaux comme le Tatou, ou ce type singulier qu'on a appelé le Paresseux parce qu'il vit de longs temps d'immobilité suspendu et comme accroché aux branches des arbres.

Chez les Carnassiers de l'Éocène et de l'Oligocène, les caractères sont encore synthétiques, leur dentition est peu spécialisée, gardant des affinités avec celle des Omnivores, au point d'orienter aussi bien vers celle des Ours que vers celle des Martres ou des Hyènes. C'est seulement à la fin du Tertiaire et au début du Quaternaire qu'apparaissent ces types hautement spécialisés de Carnassiers où il existe à la mâchoire supérieure, comme chez le Machairodus du Pliocène d'Europe, le Smilodon du Quaternaire d'Amérique, ces canines que l'on a comparées à la lame d'un cimeterre pour leur forme courbe et tranchante.

Ceci est un de ces rares cas montrant à quels termes d'extrême spécialisation mène ce qu'on a appelé l'évolution orthogénique (orthogenèse), c'est-à-dire le développement qui, engagé dans un sens y

persévère, accentuant un caractère jusqu'à l'exagération — c'est le cas des canines monstrueuses du Machairodus — qui finit par être fatale au groupe et peut avoir contribué à en amener l'extinction. Ceci est une idée qui a été reprise par Decugis dans un ouvrage très original intitulé *Le vieillissement du monde vivant* (1941) ; ce biologiste s'est demandé s'il ne fallait pas chercher dans l'orthogenèse une cause de la disparition progressive des groupes. Il observe, par exemple, qu'un accroissement continu de taille finit par créer des organismes manquant d'équilibre, chez lesquels existent des disharmonies structurales (acromégalie) qui sont un stigmate de dégénérescence. Il fait état des cas du Megaceros, le grand cerf d'Irlande aux bois buissonnants, des défenses du Mastodonte qui devaient l'encombrer plus que le servir, et il propose d'expliquer ainsi l'extinction de ces Reptiles géants du Secondaire, longs de 20 à 30 mètres.

Dans chaque grand embranchement, nous voyons les groupes pousser dans toutes les directions, prendre naissance, puis se spécialiser et grandir, occuper successivement tous les habitats sous des formes adaptées. Avec un parallélisme frappant, il y a chez les Mammifères au Tertiaire, comme chez les Reptiles au Secondaire, des animaux nageurs, en mer ou dans les eaux douces, les uns herbivores (les Sirénéens), les autres carnivores (Pinnipèdes) ; phoques, morses, Cétacés : baleine) ; il en est d'adaptés au vol, les Cheiroptères : vampire, chauve-souris, comparables au Rhamphorynque chez les Reptiles.

Diversité de forme, taille croissant jusqu'à donner des êtres géants, spécialisation de plus en plus accentuée des organes, multiplication des types et des individus ; tels sont les traits qui caractérisent un règne succédant à un autre : Mammifères au Tertiaire, Reptiles au Secondaire.

J'aurais d'ailleurs pu choisir des exemples d'évolution parallèle à ceux-là, par exemple, chez les Poissons. Il appartient ici à un plus compétent que moi-même de vous en parler.

Enfin, pour compléter cet ensemble de faits et souligner encore comment ce que la Paléontologie nous apporte vient confirmer la succession progressive des êtres vivants à travers les âges, il faut mentionner les types de passage d'un groupe à l'autre.

Le cas de l'Archéopteryx marque l'une des plus remarquables découvertes d'un *missing link* c'est-à-dire de l'un de ces anneaux qui manquent pour établir la continuité de la chaîne ; par lui les lignées Reptiles et Oiseaux se rejoignent. À mesure que les recherches s'étendent, guidées qu'elles sont par l'hypothèse d'une évolution progressive, on peut dire que les vides se comblent — sans pour cela que les problèmes soient toujours résolus ; ils sont plus souvent déplacés et leur solution rejetée dans un passé plus lointain. Comme chez les plantes, on voit chez les Vertébrés s'aligner des phylums

parallèles dont l'origine première échappe. Nous retrouvons les mêmes difficultés quand nous arrivons à l'homme, dont l'apparition vient clore au Quaternaire tout le développement des vertébrés, en même temps qu'elle couronne l'édifice.

Jusqu'à présent, je n'ai pas parlé des Invertébrés. C'est un domaine immense ; je me bornerai à y glaner quelques cas suffisants pour montrer qu'ils n'échappent pas à la loi générale. Prenons l'embranchement des Arthropodes dans lequel se placent les Crustacés et les Insectes — deux sortes d'animaux connus, les premiers parce qu'ils sont comestibles et recherchés, les seconds parce que leur présence et leur incroyable multiplication créent trop souvent (moustiques et mouches) une force ennemie contre laquelle il faut organiser la lutte. Les Crustacés sont équipés pour vivre dans l'eau (branchies, pattes, nageoires) ; ils sont connus dès les époques géologiques les plus reculées, celles du Cambrien et du Silurien où il semble qu'il y eut plus d'étendues de mers que de continents ; à vrai dire nous n'en connaissons guère les formations continentales. Les Insectes (trachées) ont apparu, sont connus seulement aux temps où il y eut de plus larges surfaces continentales et dont les dépôts continentaux ont été préservés sur une plus grande échelle. Les plus anciennement connus datent du Dévonien, où il y eut de grands espaces désertiques ou lacustres. Ils sont dépourvus d'ailes. Les premiers Insectes munis d'ailes sont ceux du Houiller, de grandes libellules de 70 cm. d'envergure — et un autre groupe avec mâchoires de type broyeur (assez semblables à cet égard aux Blattes actuelles), adaptés à vivre dans les grandes forêts marécageuses ; à cette époque et dans ce milieu du Houiller, où la plus grande partie de la végétation était sans fleurs n'auraient pu subsister des insectes avec appareil buccal suceur ou piqueur. Criquets et sauterelles apparaissent au Jurassique (broyeurs aux fortes mandibules), les mantes à l'Oligocène. À partir d'alors commence cet enrichissement du groupe par diversification et multiplication que nous trouvons aujourd'hui excessives ; l'ambre de la Baltique (Oligocène) nous en a gardé des exemplaires ; les calcaires à phryganes du Massif central français, d'autres spécimens de toutes ces familles d'insectes à métamorphoses, pourvus d'appareils suceurs qui leur permettent de pomper le nectar des fleurs, ou piqueurs qui les mettent à même de saigner les mammifères : plantes à fleur et Mammifères ont leur épanouissement au Tertiaire.

Jusqu'à présent, pour les animaux comme pour les plantes, il n'a été question ici que d'orthogenèse, c'est-à-dire d'évolution progressive. N'y a-t-il jamais régression ?

Écartons d'abord l'idée, même l'affirmation, car elle a été proférée par des auteurs déjà anciens il est vrai, qu'aucune régression n'est possible parce que la loi qui s'applique dans le monde matériel à la transformation de l'énergie s'appliquerait également au vivant : un

organe transformé ne revient jamais, dans la série animale, à sa forme primitive. En réalité, il n'y a rien d'aussi absolu et rigide dans le domaine de la vie.

Dans chaque groupe, on observe une évolution parfois régressive si l'on veut appeler de ce nom la période de sénilité avec retour dans l'organisme de certains traits propres aux formes primitives.

De ceci, il y a un exemple classique que je rappelle en quelques mots, celui des Ammonites à la fin du Crétacé. Dans ce groupe des Ammonites, qui a régné pendant tout le Secondaire, se diversifiant à l'infini et se répandant par tout le globe, on retrouve à l'époque du Crétacé des formes déroulées qui se multiplient alors pareilles à celles des premiers Céphalopodes du Silurien et du Dévonien ; les sutures qui reparaissent dans quelques genres sont du modèle simplifié des Cératites du Trias. Il y a un exemple de sénilité, précédant de peu la disparition du groupe entier ; les choses se passent comme si la série des variations possibles était épuisée et qu'il ne restât plus qu'à reproduire des formes déjà antérieurement réalisées (des cloisons persillées des Pinacoceras aux Cératites, toutes deux d'ailleurs au Trias).

Autre cas : l'ordre lui-même est au terme de sa vitalité. Les représentants, les familles d'abord, les genres et les espèces ensuite se raréfient avant de s'éteindre ; ainsi les Trilobites du Cambrien au Permien.

D'autres fois, ce sont des simplifications de structure, du moins en apparence ; ainsi chez les Graptolithes, groupe cantonné au Silurien : leurs formes les plus complexes, ou du moins les plus variées, avec colonies assemblées par quatre ou par deux, et avec rangées parfois doubles, existent au début du Silurien, tandis qu'à la fin de cet âge, les formes sont plus simples, le genre le plus élémentaire de tous, le genre Monograptus, étant l'un des derniers.

Mais toujours, comme inexorablement, à côté d'exemples comme ceux-là, on enregistre à chaque époque une progression des organismes sur les précédents. Toujours aussi il y a un développement en progrès d'une ère à l'autre, du système nerveux, l'organe qui permet à l'esprit (au sens le plus large du mot) de s'exercer ; des Reptiles aux Mammifères, de ceux-ci aux Hominidés et, chez ces derniers, l'ascension est également continue jusqu'à l'homme.

En résumé, quand on envisage dans son ensemble l'histoire des êtres vivants, c'est une observation qui s'impose ; il y a perfectionnement organique à travers les âges, depuis les êtres inférieurs jusqu'à l'homme. On a pu écrire pour exprimer ce fait que « toute histoire de la vie est celle d'une marche ascendante vers l'homme, et vers la prédominance du système nerveux, par lequel s'exercent les commandes de l'esprit ».

II. LES GROUPES SONT-ILS SORTIS LES UNS DES AUTRES ?

Ces groupes dont l'enchaînement est manifeste sont-ils sortis les uns des autres ?

Une fois le fait acquis de cette succession d'êtres en progrès d'une période à l'autre, il se trouva très tôt des Naturalistes pour admettre qu'il n'y avait pas seulement succession, mais descendance, l'organisme plus perfectionné, plante ou animal, sortant du plus simple par génération, mais avec ses caractères nouveaux. De ceci, la géologie ne pouvait ni administrer la preuve, ni découvrir le mécanisme : 1° parce qu'il y a trop de lacunes dans nos données ; nos archives paléontologiques sont partielles, infimes par rapport à l'ensemble ; 2° surtout parce que les formes fossiles sont fixées ; il n'y a pas d'expérimentation possible. Il fallait donc chercher à découvrir ailleurs le mécanisme de ces changements, dans l'observation du monde actuel des vivants. De là sont sorties les théories que vous connaissez tous : Darwinisme, Lamarckisme, Mutationnisme. Je ne fais qu'en rappeler les lignes essentielles. Le Darwinisme : l'idée de la sélection puisée par son auteur, Darwin, dans le spectacle et les résultats des méthodes employées par les éleveurs en Angleterre ; la nature aurait généralisé le procédé et obtenu ainsi des variétés qui devinrent des espèces nouvelles. L'idée de Darwin peut être aussi combinée avec celle du Français, Lamarck: l'adaptation au milieu, la survivance des mieux adaptés dans la lutte pour la vie. Ces vieilles théories ont encore leurs partisans, car elles sont basées sur des observations exactes et contiennent une part de vérité ; mais elles sont trop exclusives : ce n'est pas toujours le plus apte qui survit : les modifications somatiques causées par le milieu ne s'inscrivent pas dans le patrimoine héréditaire. Même modifiés, les cadres primitifs de ces systèmes ne peuvent contenir les faits rebelles.

Le Mutationnisme recueille aujourd'hui beaucoup plus d'adhésions. D'après cette théorie, une variation prend naissance dans le germen (partie des cellules germinales) ; cette variation peut donc affecter une partie quelconque de l'individu ; seules réussissent et se perpétuent les mutations qui présentent un caractère d'utilité pour la vie en un milieu donné. Cette théorie est partie d'une observation d'abord inexacte (car il s'agissait d'un cas d'hybridation) du botaniste de Vries ; on y a englobé des éléments empruntés aux observations et aux théories de Weissmann sur l'hérédité et ajouté l'idée de la préadaptation de Cuénot. Le Mutationnisme discerne ainsi et utilise la part de vérité détenue dans chacune des théories anciennes ; surtout il donne un principe de solution pour aborder et peut-être pour élucider le problème des variations de la vie, donc éclairer le mécanisme de l'Évolution. De tous côtés à l'heure actuelle, des généticiens sont à l'œuvre dans les laboratoires et chaque jour par leurs expériences obtiennent des mutations brusques. Sans doute l'amplitude de celles-

ci est-elle minime et ne permet-elle pas de dépasser le cas individuel, les caractères acquis n'apparaissant généralement pas dans la descendance des mutants (ou s'accompagnant bientôt, ou se corrigeant par un retour aux caractères de l'espèce). Mais il reste que l'on peut maintenant tenter d'expliquer de cette façon les changements qui interviennent à l'intérieur des phylums — et avec plus de hardiesse, le passage d'un groupe à un autre.

Le Mutationnisme n'est évidemment qu'une manière de concevoir les choses, l'appel à un mécanisme dont on aperçoit comment il est monté et comment il peut jouer dans bon nombre de cas dans la nature. Il ne s'agit pas encore d'une démonstration péremptoire. Comme pour les autres théories, seul l'avenir nous fixera sur la valeur du Mutationnisme pour expliquer les transformations et l'évolution.

III. L'ÉVOLUTION INTÉGRALE : COMMENT ELLE SE FORMULE ; COMMENT ELLE S'ARTICULE SUR LES FAITS CONNUS

La succession au cours des temps géologiques d'êtres vivants de plus en plus perfectionnés est certaine. C'est cela qu'on appelle l'évolution des plantes, des animaux. Le terme choisi est maintenant consacré ; il prête cependant à confusion car il suppose résolu le problème — et l'on vient de voir qu'il ne l'est pas — que l'on propose bien des théories au sujet du mécanisme des transformations, mais que l'on n'a pas encore administré la preuve de fait de celles-ci.

Évolution implique — c'est le sens étymologique du mot — qu'un perfectionnement est un phénomène déterminé par un élan propre à la vie, et qu'il passe d'une génération à l'autre. Humble dans ses origines et ses premières conquêtes (bactéries, quelques algues connues au Précambrien), la vie à travers les difficultés continuelles s'est harmonieusement hiérarchisée (plantes, invertébrés, vertébrés) ; elle s'est finalement couronnée par l'apparition de l'homme, qui est l'aboutissement (d'aucuns diront la raison d'être) de ce long cheminement.

Nous voici du même coup passés du domaine de la science à celui de la philosophie. Une fois arrivés dans le domaine de la pensée et du pur raisonnement, il est possible d'ailleurs d'aller bien plus loin. Franchissant une étape de plus, on peut appliquer la théorie pour passer de la matière à la vie : l'état cristallin résulte d'une ordonnance des molécules qui obéit à des lois de symétrie, l'état colloïdal, les virus filtrants marquant des étapes.

On peut enfin appliquer également la théorie au passage de la vie animale à une vie psychique, d'abord diffuse, puis conscience et intelligence capable d'abstraction.

C'est l'Évolutionnisme intégral, du premier atome de notre système astral jusqu'à l'homme, « de la monère à l'homme », comme on disait il y a quelque 60 ans. Car c'était la théorie déjà en vogue

il y a plus d'un demi-siècle, soutenue alors par Haeckel, Büchner. À une époque plus récente, elle a été arrachée en quelque manière à ces purs matérialistes, et située à un plan plus élevé, où le spiritualisme retrouvait droit de cité dans l'Évolution créatrice de Bergson.

Ces divergences ne doivent pas étonner : « sur des bases communes, les faits révélés par les sciences biologiques, puis par la Paléontologie, les tendances philosophiques des auteurs se sont greffées : spiritualistes et matérialistes se sont une fois de plus affrontés en champ clos. Il ne faut pas espérer les mettre d'accord car les parties sont irréductibles pour des raisons extrascientifiques ».

Il faut bien dire qu'il y eut au XIX[e] siècle une science imbue du préjugé matérialiste pour laquelle il fallait tout expliquer à partir de la matière et seule la notion, « toute théorique », d'évolution perpétuelle du monde semblait répondre à cette exigence, puisque ainsi tous les « devenirs » étaient possibles.

En face d'eux, pour les spiritualistes, la notion d'évolution est en harmonie avec la puissance de Dieu qui intervient dans son œuvre aux heures cruciales, en lui accordant tout ce qui est requis pour son développement, tel que son intelligence l'a prévu avant toute réalisation. Dans ce contenu d'intentions, nous mettons des coupures d'ordre métaphysique, celles qui permettent à la matière de servir de substratum à la vie, qui permettent à la vie d'être haussée jusqu'à devenir l'instrument de l'esprit : intelligence et conscience [1].

Pour conclure, je voudrais relier les faits, qui viennent d'être résumés à grands traits, au cadre des temps géologiques dans lequel ils se sont déroulés.

Nous savons qu'une fois la croûte terrestre consolidée et sa surface distribuée en continents et en bassins ou cuvettes océaniques, la vie y apparut, il y a quelque 1,500 millions d'années ; ce chiffre n'a rien d'absolu, c'est un ordre de grandeur. Comment elle surgit ? D'où elle venait ? Nous l'ignorons. Mais, dès le Cambrien (500 millions d'années), tous les types principaux actuellement connus existent ; il y a des centaines de mille variétés, mais toutes rentrent dans ces groupes. Au début de l'Éocène (disons : il y a 40 à 30 millions d'années), épanouissement soudain des Mammifères : une douzaine d'ordres prennent existence. Après cela, l'apparition des groupes est terminée, encore que là également (chez les Mammifères et aussi chez les Angiospermes) la variation des types (genres, espèces) se produisit dans toutes les directions. Il n'y a pas davantage de nouveaux oiseaux depuis ces 30 millions d'années, depuis le début de l'ère tertiaire. Il n'est pas apparu non plus de nouvelles familles de Plantes. Il en est de même pour les Poissons, pour les Invertébrés, Mollusques, Vers, Échinodermes, etc . . . ; ils paraissent définitivement

1. F. Bergounioux, *Harmonies du monde moderne*, Paris 1945, pp.101-105.

fixés dans un certain type immuable (ou cadre). Plus s'étend la connaissance du monde des vivants au Tertiaire, plus se complète le récolement des formes vivantes, animaux, plantes, plus cette constatation se confirme : de nouvelles espèces, pas de nouvelles familles. Quand on arrive au Quaternaire, l'évolution progressive du monde animal, celle qui crée les grands types organiques, les principaux phylums, semble arrivée au point mort ; elle fait place alors à celui des hominidés [1].

Ainsi toutes les lignées animales ont aujourd'hui subi la crise évolutive et l'ont dépassée : cette crise a saisi les Batraciens à la fin du Primaire, les Reptiles au début du Secondaire, les Oiseaux à la fin du Secondaire, les Mammifères au Tertiaire. Elles se trouvent donc toutes sur la pente descendante, sont entrées dans la phase décadente de leur histoire. L'animalité a cessé d'évoluer à l'instant où paraît la strate humaine, c'est-à-dire le palier supérieur qui la relaie et se substitue à elle.

J'emprunterai ma conclusion à Broom [2] : « Ceux qui considèrent que tout ce déroulement si étrange de l'Évolution est le résultat d'un accident, ou d'une série d'accidents, sont tout à fait libres de penser ainsi. Mais personnellement je crois qu'il y a là un plan. Et quoiqu'il y ait eu, au cours très lent de l'Évolution, des hauts et des bas, et même des cas que nous sommes tentés d'interpréter comme des erreurs, un plan a continué de se réaliser, et nous nous sentons assurés qu'il ne peut manquer d'atteindre son but. » Telle est la position d'un homme de science, gagné, par l'examen des faits, à l'idée d'Évolution, mais qui possède et qui garde la notion d'un Dieu personnel, gouvernant le Monde qu'il a crée.

Mgr G. Delépine.

1. A. Vandel, *L'homme et l'évolution*, Paris 1949, pp.188-190.
2. R. Broom, *Finding the missing link*, Londres 1950, p.101.

The Status of Evolutionary Theory

The question we are discussing today, if my understanding is correct, is whether the doctrine of evolution has been conclusively proved or whether it must still be regarded as simply a scientific hypothesis, that is to say, one of the possible explanations of the diversity of the organic world in the past and in the present.

Some preliminary clarification is necessary. The question as I have framed it is, I think, in several respects ambiguous. To begin with, the methods of proof and the degree of certainty attainable in the various departments of science, taking this word in the broad philosophical sense, differ very considerably. We cannot expect to prove a proposition in natural science in the same way and to the same degree as we can prove a proposition in metaphysics or mathematics. The natural sciences have for their object the material world. Our knowledge of the material world entails continuous contact by means of our senses. Consequently, direct observation is an essential feature of the development of the natural sciences and an essential element in building up the proofs of its propositions. The farther we have to depart from direct observation, the less certain our propositions become and the more speculative they become, taking the word " speculative " not in the true philosophical sense, but as indicating guesses and hypotheses corresponding more or less to the facts of nature and put forward as possible explanations of these facts.

Therefore, while we cannot ask in a proposition concerning evolution the degree of certainty we expect in mathematics or metaphysics, there is a certain minimum we must require before we can agree that the proposition has been proved.

The word " evolution " is also an ambiguous term. It would indeed be quite a task to list all the senses in which it has been used.

However for the purpose of this argument we may distinguish roughly two meanings of the word " evolution. " The first is the meaning given to it by the old founders and propagandists of evolutionary theory : which is, the progressive development of living forms from the lowest level near or identical with, the inorganic level, to a complex or higher level which they all agreed was reached in the human species. I think practically all of these fathers of evolution had in their minds the philosophical concepts of degrees of being exemplified in their discussions by the use of the words " lower " and " higher." They had these ideas in their minds in spite of the fact in general they repudiated philosophical doctrines. The mere idea of complexity does not convey what they were driving at. A heap of stones is more complex than a single stone, but it is not higher in the

sense which the evolutionists used this word. Thus the classical idea of evolution is that of progressive development. The other way of interpreting the word " evolution " is to regard it simply as equivalent to the word " change " or " motion," eliminating the idea of direction and particularly of progress. This is the viewpoint taken by such modern evolutionists as Étienne Rabaud who denies emphatically that it is proper to speak of higher or lower or of increase in adaptations or of biological progress. Organisms change under the influence of the environment and that is all we can mean or should mean by the word " evolution."

This distinction is of course only a very rough distinction. A great deal could be said about this point. However, the two points of view thus crudely distinguished must be kept in mind when we are considering whether evolution has been satisfactorily proved or not.

Now if we are asked whether evolution in both these senses is an objective reality in the organic world, we must answer that it is ; but we are not thereby agreeing with the fathers of evolutionary theory and their modern descendants. Evolution in the sense of progressive development is objectively evident in the ontogenetic development of organisms. A human being begins as an organism which must be regarded, from the philosophical standpoint, as low in the scale and must be considered, from the anatomical standpoint, as extremely simple and it progresses by an orderly and ordered development to a very complex condition in which powers which the philosopher can justifiably call of a higher level are manifested. This is true evolution which we see going on before our eyes. Evolution in the second sense of change is equally obvious and we see it continually everywhere. This change seems to be random or non-directional. The evolutionary geneticists deny, in general, that the mutations they regard as the basis of evolution are *progressive*. They assert, in fact, that they are non-adaptive, except by accident. If there is, in fact, a development in the sense of better adaptation to the conditions of life, this is therefore due to a succession of accidents. The geneticists of this school speak of " pre-adaptation " ; but this does not indicate any positive connection between the situation that must be met and the mutation that meets it ; the " pre-adaptation " is so, simply because a circumstance arose, by chance, in which the mutation was useful. It is clear that there is no real pre-adaptation in such cases. Nevertheless, the geneticists (e.g. Patterson and Stone, in *Evolution in the genus Drosophila* (1952), p. 234) maintain that the " visible morphological differences between species " are adaptive, which means that the most minute characters mentioned in a specific definition are positive conditions of its existence.

Evolutionists like Julian Huxley and G. G. Simpson assert that in man the evolutionary process has produced a being that is unique in that he is capable of purposeful actions, for which he is responsible

and yet affirm that the evolutionary process itself is entirely purposeless and that man was engendered by material forces alone. This is called by Julian Huxley " a glorious paradox." It appears rather to be simply a contradictory proposition. To be truly responsible, a being must be the source of its own action and thus, in so far as it is responsible, independent of the material world and material forces. If it is not, then its action is determined, in the last analysis, by these forces ; and its liberty, on which its responsibility depends, is an illusion, as the old materialists — more logical than Huxley and Simpson — had always maintained. Whereas the Aristotelian recognizes in all things a principle of finality and a principle of randomness or non-finality, so to speak, Huxley and Simpson admit in man a principle of finality, but exclude it from the rest of the universe. The impression one gains from the writings of the evolutionists of this school, is that they have lost the power to resist certain evidences, have found no way of reconciling them with certain other beliefs to which they are attached but have decided to make the best of a bad job.

Now I think it is right to say that the intensive and extensive study that the modern geneticists have made indicate on the whole that there is an order in the changes in the sense that their characteristics can be expressed in general laws. This fact certainly does not suggest that the organic world is simply in a state of flux ; it rather suggests, like the facts of ontogenesis or individual development, that the changes are regulated by certain specific principles. Looking at it in another way, we might say that they suggest the essential soundness of the Aristotelian view that every material thing is composed of a principle of specificity and stability and a principle of non-specificity or change which the Aristotelian calls " form " and " matter." As the mediaevals put it, the material thing is *ens mobile :* something essentially changeable. Anyone who says that organic species are absolutely fixed is therefore departing from the Aristotelian viewpoint and interpreting nature in terms of platonism. He is interpreting it as a collection of pure unchangeable forms, whereas the Aristotelian sees it as a collection of forms immersed in matter in which there is a possibility of definition provided we do not attempt to make the definition too rigid and unalterable. On the other hand, if the entity of material things is determined and governed by a specific principle then it is clear that they will not of themselves tend to be other than they are, changes will in general occur within the confines of the type and forces that tend to push the organism outside the type will simply be lethal to it. It is therefore difficult to accept the view, expressed by P. Leonardi, that there is in an organism an *inherent evolutionary tendency.*

As Aristotle said long ago, art imitates nature and we can perhaps best understand the problems involved in the idea of evolutionary change according to the classical theory of the founders of the doctrine

if we consider machines which resemble organisms in that there are heterogeneous assemblages of parts whose activities converge toward a certain specific end. We can readily see without any elaborate argument that random changes in the disposition of the parts of any machine and particularly of complex machines, like typewriters or microscopes, are not at all likely to have the result of transforming the assemblage into an entirely different machine directed toward some entirely different end. For example, random changes in the disposition of the parts of a typewriter are not likely to transform this into an adding machine. They will simply transform it into a broken down or non-functional typewriter ; in other words, into a heterogeneous assemblage of which the parts do not converge toward any particular end. This corresponds with our experience with living organisms. If we attempt to deflect the course of development of an animal, we do not produce a different species ; we merely produce a monster or kill the organism. As the geneticists have shown, mutations are in the majority of cases not adaptive but pathological or lethal. The data of genetics, says the great zoologist Caullery, do not constitute a basis for the classical evolutionary doctrine. Attempts have been made to find proofs of evolution in the data of comparative anatomy and in embryological development but, to my mind, these proofs are entirely worthless and do not really merit examination. There is of course plenty of evidence for variation or in other words for the idea that we cannot define species in the purely Platonic sense, but there is no satisfactory evidence for the doctrine of evolution as it was put forward by the founders of the doctrine and their modern disciples.

Since nothing that can be reasonably regarded as a real proof of evolution can be obtained from the study of living forms, it is necessary to turn to the geological history of living organisms. However, we must note first that we really cannot use the word " history " in this connection. History is a human product. It depends on the existence of documents or of oral tradition and or, in other words, on a record of events made by other human beings. Where such a record does not exist we cannot really speak of history. Now though the phrases " geological history " and " palaeontological history " are commonly used, these are not histories in any true sense. There can be no history concerning the object of these sciences because there have been no witnesses of the events with which they deal. From the data they have collected, the geologists and palaeontologists have attempted to construct a history or at least a chronology of the events that have occurred in the history of the earth. To what extent they have been successful is a matter of opinion. Geologists have come to a pretty general agreement about the order of the main groups of rocks and this is perhaps a sign that the arrangement has a reasonably good scientific basis. However, they seem to admit

that the order of the fossils is based on the rocks, while the order of the rocks is based on the fossils so that there is a certain circularity about the type of argument used in geology. There are a few geologists, admittedly unorthodox, who regard the standard geological arrangement with great scepticism. They say that the strata which are currently regarded as chronologically the earliest just happen to be the ones the early geologists found at the bottom when they first started to work in a certain particular area and that if they had started work in another area, they would have chosen another series as the lowest. They allege furthermore that the order of the fossils is not something which has been imposed by geological data but that it is derived from an *a priori* idea as to how the organic forms should appear in nature, this idea in turn being based on deductions from embryological development. They say also that there are many cases in which the order of the strata does not correspond to the classical order and that the explanations put forward to get rid of these difficulties are not at all plausible. I do not pretend to assert that these objections to orthodox geological doctrine are decisive, but I do think they are sufficiently serious to make us hesitate about the idea that geology can present us with what is really equivalent to a historical account of the appearance of organic forms on earth. This feeling, I think, is reinforced by the procedures of the geologists and palaeontologists in regard to the descent of organisms and particularly perhaps with regard to the descent of man. There are hardly two palaeontologists who are in agreement on this matter and hardly a year passes without some palaeontologist coming out with an entirely new theory in regard to human origins. The reason for these discordancies must lie in the incoherent and fragmentary character of the data which is of such a nature that a variety of plausible but inconclusive interpretations can be placed on it.

Another very serious difficulty which was for long kept in the background by the exponents of evolutionary theory in the belief that it would disappear in the course of time and also perhaps because a full statement of it would have made it difficult to produce conviction in readers or hearers, is the discontinuity of morphological types in the geological strata. Now that the early enthusiasm for the classical geological doctrine has somewhat worn off, more and more attention is being paid to this difficulty. If we take a group like the insects, we find that the sub-groups — the orders, the families and even in general the genera — appear suddenly in the geological strata and are not connected by series of intermediate forms showing the gradual transition that the classical evolutionary theory requires. The palaeontologists have tried in a rather simple minded way to get around this difficulty by calling these groups of apparently independent origin, cryptogenous, meaning that we do not know where they started though they probably started somewhere. However, if we

take the facts as they stand, the facts are that the groups appear suddenly in the strata and we have no reason therefore to say on scientific grounds that they appeared gradually. If organisms were amorphous and did not present co-ordinated morphological adaptations the case would not be so serious, but, as I have already said, an organism does resemble a machine in that it is a heterogeneous assemblage in which differing parts contribute by their different actions to the same end which is subservient to the needs of the organism and it is extremely difficult to conceive how transitions between such co-ordinated types could take place. Still more difficult is it to imagine that such transitions could occur as a result of purely random variations in the organism or under the impact of random variations in the environment. Authors like Caullery and others freely admit this difficulty and evolutionists like Rabaud, as I have already said, attempt to get around it by arguing that the idea of co-ordinated adaptations is an illusion.

Some of the more recent evolutionists, like Simpson, appear to accept the evidence that types appeared suddenly and yet admit that they present co-ordinated adaptations, which, nevertheless, arose by a purely random process. The difficulty of maintaining simultaneously these discordant propositions is perhaps not much greater than in the system of gradual long-term evolution. Still, it is more apparent and the fact that the modern school fails to perceive it shows how far their philosophical ability has declined in comparison with their Victorian ancestors.

To the philosopher, the subject has a somewhat different aspect and indeed a profoundly different aspect. Contemplating the assemblage of living creatures, he finds that they display not merely material differences but formal differences and what may be called differences in that they represent different points in the scale of being and furthermore that between these points a transition under the influence of random material factors or through the efforts of the organism itself are strictly impossible. Therefore, if we start with the assumption that evolution has occurred and that there has been no matter in how discordant or irregular a manner a rise from a low ontological level to a high ontological level, this must be due to the action of factors which do not form part of the physical world. Therefore, we must invoke the action of external intelligences of the type that the classical philosophy has always considered to be part of the universal hierarchy. Only through the action of such intelligences can we conceive the transitions which are necessary for a process of progressive evolution and only in this way can we explain the abrupt transitions that palaeontology shows us. This I understand to be the view of Charles De Koninck.

I will freely admit that this interesting and valuable idea eliminates many of the difficulties I find in the doctrine of evolution considered

at least from the philosophical standpoint. However, I do not think it is an idea that would readily be accepted by the associations for the advancement of science or by orthodox biologists at the present time. " There is neither need nor excuse," says G. G. Simpson, [1] " for postulation of non-material intervention in the origin of life, the rise of man, or any other part of the long history of the material cosmos." Indeed, according to this author, evolutionary change " is not progress in a general or objective sense and does not warrant choice of the line of man's ancestry as the central line of evolution as a whole." In any event " man is the result of a purposeless and materialistic process that did not have him in mind." The views of this author are probably representative at the present time and, if this is true, we cannot expect biologists in general to accept the idea that evolution is a directed process, much less a process directed by immaterial intelligences.

Furthermore, I do not see any particular necessity to invoke this idea unless I have been convinced by the scientific data that some kind of progressive evolution has really occurred and to my mind the data do not impose this idea. Personally, I think the value of Professor De Koninck's view is that it frees us from the accusation that we refuse to accept evolution as a fact because of preconceived religious or philosophical ideas. If we can escape from this, we also escape from the compulsion to accept evolution in the classical sense as a fact. If we can reach this point, then we can begin to look around for other explanations of the diversity of organic form and of the various facts that have been regarded as inexplicable except on the ground of evolutionary theory. It seems to me that this would be extremely beneficial. Surely all explanations of organic diversity have not yet been found and surely there is room for original thought and research on this matter. In my own view, the developments in studies of morphogenesis from a physical and chemical standpoint, that is to say from the standpoint of the positive sciences, may eventually clear up many of the problems which are now solved only in purely verbal terms by the application of evolutionary doctrine.

However this may be, I hope that what I have said is sufficient to show that while the doctrine of evolution has certainly been fruitful in many ways and while it is an interesting and plausible doctrine, the facts at our disposal do not oblige us to accept it as a truth and that the most reasonable scientific attitude and the attitude most likely to lead to scientific advancement is to keep our minds free and continue to adhere to evolutionary theory, if we wish to do so, merely as a theory. My view, therefore, is that the doctrine of evolution does not refer to a fact but is merely a hypothesis.

W. R. Thompson.

1. *The Meaning of Evolution*, revised and abridged edition, 1952.

De l'évolutionnisme anthropologique

Je vais considérer la question de l'évolutionnisme anthropologique, non point comme paléontologue, biologue, embryologue, mais comme philosophe, ou tout au plus, comme philosophe chrétien, c'est-à-dire attentif à la règle négative de la foi (Lachelier).

Je ne dis donc rien ni pour ni contre la réalité de l'évolution. Je laisse aux savants de nous dire si un observateur de l'histoire de notre planète aurait vu une certaine ligne de générations dans laquelle le premier générant aurait été un organisme très simple, ou du moins inférieur, et certainement un pur animal sans raison, tandis que le terme de ces générations serait l'homme. À dire la vérité, je ne crois pas qu'à l'heure actuelle, une telle hypothèse puisse revendiquer pour soi plus que la probabilité. Son meilleur argument, en effet, l'argument paléontologique, est certainement mis en question par la découverte plusieurs fois répétée d'ossements d'*Homo sapiens*, aussi anciens ou plus anciens que les ossements des formes dites inférieures, et je ne vois pas qu'on ait réfuté la puissante argumentation de Louis Vialleton contre l'évolution généralisée. Mais j'abandonne cette question de fait aux spécialistes. Qu'il s'agisse d'une histoire réelle ou d'une hypothèse, ma tâche demeure la même, qui est d'étudier les conditions philosophiques de l'évolutionnisme étendu jusqu'à l'homme. Quand même on serait assuré que l'homme est apparu au bout d'une série animale avec la même continuité phénoménale que les autres termes de la série, il resterait à examiner si un tel passage de l'ordre du sensible à celui de la pensée a pu s'accomplir sans l'action de causes profondes que l'observation scientifique ne peut atteindre, autrement que dans leurs effets.

Il y a une espèce humaine, au sens philosophique d'espèce ; je veux dire que l'homme a une essence déterminée qui ne peut être modifiée, sans être détruite, qui n'a pas du plus ou du moins, mais qui est tout entière ou n'est pas. L'homme est un animal raisonnable. Il saisit l'intelligible, si faiblement que ce soit, et c'est par là qu'il diffère, non pas simplement selon le degré, mais selon la nature, de tout être qui n'a pas cette faculté. Tandis que le monde de la sensation est lié à la matière organisée et s'évanouit quand celle-ci lui manque, le monde de la pensée est celui des êtres spirituels. Aristote en était aussi convaincu que Platon et il regardait comme immatériel et immortel le principe peut-être unique, selon lui, par lequel nous pensons. Et comme il est impossible que le principe d'une pensée qui est nôtre et qui fonde notre responsabilité soit extérieur à nous, il nous est donc intérieur et par suite il faut attribuer à l'homme une âme spirituelle et immortelle. Cette âme a sans doute besoin d'un corps pour trou-

ver la matière où elle découvrira l'intelligible, mais à ce corps c'est elle qui donne l'être et la vie et elle n'a pas besoin de lui pour subsister dans l'être. C'est par Dieu seul et par une opération proprement créatrice, que son existence lui est donnée [1].

C'est pourquoi un premier point est assuré : l'homme ne peut pas être tout entier le produit de l'évolution. Sa partie la meilleure, son âme, est créée par Dieu. La question de l'évolutionnisme anthropologique ne regarde que le corps de l'homme.

Venons-en donc à ce corps. Aujourd'hui, il est le terme de la génération. Quand apparut le premier corps humain, qui ne pouvait venir de l'union de l'homme et de la femme, qui l'avait produit ?

Si nous considérons les seules causes qui se trouvaient alors dans l'univers créé, nous n'en trouvons aucune qui puisse le faire venir à l'existence. Supposons en effet des animaux parvenus au sommet de l'ordre sensible. Je dis : ils ne peuvent donner origine à un corps humain.

En effet, le corps de l'homme doit être proportionné à son âme. Il est la matière dont l'âme est la forme, la puissance dont l'âme est l'acte. Telle forme, telle matière ; tel acte, telle puissance. À une forme supérieure, il faut une matière supérieure. Les animaux peuvent engendrer des animaux sans que l'effet dépasse la cause. Ils sont des agents dont l'action transmet la ressemblance ; ils sont des procréateurs qui engendrent leurs semblables. Leur action procède de leur forme qui se sert de la matière et des actions du composé pour donner naissance à une forme semblable à elle-même, et du même composé, à un corps proportionné à cette forme qui en est l'acte. Il n'y a pas là d'autre mystère que celui de la causalité en général. À l'effet qui résulte, nous assignons une cause qui a le même degré d'être et nous n'allons pas au-delà de l'axiome : « Agens agit simile sibi », l'agent cause son semblable.

> Manifestum est autem quod factum est simile facienti ; quia omne agens agit sibi simile. Et ideo id quod facit res naturales, habet similitudinem cum composito ; vel quia est compositum, sicut ignis generat ignem ; vel quia totum compositum, et quantum ad materiam, et quantum ad formam, est in virtute ipsius, quod est proprium Dei. Sic igitur omnis informatio materiae, vel est a Deo immediate vel ab aliquo agente corporali ; non autem immediate ab angelo [2].

Mais la proportion manque si vous exigez qu'un corps d'animal donne origine à un corps d'homme. Ce corps d'animal, placé dans les meilleures conditions, est un agent qui tend à produire de la meilleure manière possible ce qui lui est semblable, mais non ce qui lui est essentiellement supérieur. Un corps proportionné à une âme spirituelle ne peut être causé que par un corps qui soit l'instrument d'une âme spi-

1. Cf. S. Thomas, *Ia Pars*, q.90, a.2.
2. S. Thomas, *Ia Pars*, q.110, a.2, c.

rituelle. L'action du corps d'un être purement animal ne peut viser un terme si haut. Elle fait exister un être qui se trouve à son niveau, et c'est déjà chose prodigieuse. Mais donner plus de perfection que n'en possède l'agent, elle ne le peut. Nul ne communique ce qui lui manque. Qu'on le remarque, il ne s'agit pas d'orner un corps d'une perfection accidentelle, comme on pourrait y réussir par des actions autres que la génération. On fait resplendir la beauté dans un marbre brut. On retouche aussi une statue mal venue. Mais il est question dans notre cas d'une perfection essentielle, spécifique, qui est d'être proportionné à une forme substantielle spirituelle ; c'est une modification qui atteint la substance de l'être ; elle doit être causée par une substance qui soit dans l'être au même échelon.

Et ideo oportet quod forma, quae est in materia, sit causa formae quae est in materia, secundum quod compositum a composito generatur. Deus, autem, quamvis omnino sit immaterialis, tamen solus est qui sua virtute materiam producere potest creando. Unde ipsius solius est formam producere in materia, absque adminiculo praecedentis formae materialis. Et, propter hoc, angeli non possunt transmutare corpora ad formam aliquam, nisi adhibitis seminibus quibusdam, ut Augustinus dicit (De Trinit., lib.2, cap.11). *Quia igitur corpus humanum nunquam formatum fuerat, cuius virtute per viam generationis aliud simile in specie formaretur, necesse fuit quod primum corpus hominis immediate formaretur a Deo* [1].

Seuls des corps animés par une âme spirituelle engendreront des corps capables d'être animés par une âme spirituelle.

Ad quintum dicendum, quod homo generans sibi simile in specie per virtutem formae suae, scilicet animae rationalis ; non quod ipsa sit immediatum principium in generatione humana agens, sed quia vis generativa, et ea quae in semine agunt, non disponerent materiam, ut fieret corpus perfectibile anima rationali, nisi quatenus agerent ut instrumenta quaedam rationalis animae. Et tamen ista actio non potest pertingere ad factionem animae rationalis, rationibus praedictis [2].

Cela revient-il à nier la possibilité de l'évolutionnisme anthropologique ? Aucunement ; mais cela oblige à le concevoir d'une manière qui respecte les premiers principes de la raison. À tout effet, il faut assigner une cause suffisante. Le raisonnement qui précède nous convainc que des animaux purement animaux ne pouvaient engendrer les premiers corps humains, de la façon dont les hommes aujourd'hui engendrent d'autres hommes ; mais il n'exclut pas qu'ils aient eu dans la production des premiers corps humains une fonction qui expliquerait tout ce que la science aurait constaté. Oui, Dieu seul peut être la cause principale des deux premiers corps humains, ceux du premier homme et de la première femme ; et je ne dis pas seulement la cause première, comme il l'est de tout être et de tout événement, hormis le

1. S. Thomas, *Ia Pars*, q.91, a.2, c.

2. S. Thomas, *Q. D. de Potentia*, q.3, a.9, ad 5.

péché ; mais la cause principale, en ce sens que lui seul a pu suppléer à l'absence de l'homme pour former un organisme humain. Toutefois, il a pu se servir pour cette œuvre d'une matière vivante, dans laquelle il a inséré cette même vertu que l'homme y insère dans la génération ; et il l'a fait en utilisant et en élevant les dispositions déjà acquises par cette matière.

Or, une telle action de Dieu est invisible ; elle échappe aux moyens d'investigation de la science. Le savant, qui reste un pur savant, ne peut ni l'affirmer ni la nier ; il ne la connaît pas. C'est par la réflexion philosophique que l'on en découvre la nécessité. L'observation la plus attentive révélerait seulement que telle portion de matière organique a évolué en un organisme humain ; elle laisserait ignorer d'où lui est venue une telle vertu, si c'est de l'organisme précédent dont elle a été détachée, ou si une intervention supérieure a été requise. Au regard du paléontologue ou du biologue, il y aurait, de l'organisme précédent à l'organisme humain nouveau, la même continuité qu'il observe entre l'organisme générateur et l'organisme engendré dans la même espèce. Et précisément je veux dire que dans le cas où les sciences expérimentales constateraient cette continuité entre un organisme animal et le premier organisme humain, c'est-à-dire dans le cas où l'évolutionnisme anthropologique serait démontré autant qu'il peut l'être, il faudrait maintenir que la cause principale, c'est-à-dire la vraie cause de ce corps d'homme, ce n'est pas l'animal ; c'est Dieu.

Voici une analogie qui peut éclairer cette manière de voir. Dans l'ontogénèse d'un homme, l'observation d'aujourd'hui voit la même continuité que dans l'ontogénèse d'un pur animal. Et cependant la réflexion philosophique nous oblige à poser, dans le cas de l'homme, à un certain moment, une action spéciale de Dieu, à savoir la création d'une âme humaine. L'embryologie comme telle ne peut ni constater ni rejeter cette création : le philosophe l'affirme avec certitude. De même, si le paléontologue démontre qu'il y eut continuité entre un corps d'animal et le premier corps humain, le philosophe affirmera que cette continuité a été rendue possible par une intervention spéciale de Dieu, qui s'est servi d'une matière en quelque sorte préparée à recevoir son action et à devenir ainsi un corps d'homme. Le philosophe Édouard Le Roy l'a bien dit : « Il se pourrait fort bien que l'apparence continue recouvrît une véritable création. »

Après cette action divine qui a lieu à l'instant même de la création de l'âme, il faut bien comprendre que dans le nouvel organisme humain, tout est vraiment nouveau et que, de l'organisme animal précédent, seule la matière première a été conservée. Lorsqu'en effet une nouvelle forme survient, elle informe et fait tout ce qui constitue le composé, chacune de ses dispositions, chacun de ses accidents. Le premier corps de l'homme qui proviendrait de la manière que nous avons dite du corps d'un animal n'aurait rien de bestial : tout en lui

serait humain. Il serait aussi entièrement distinct en toutes ses parties du corps dont il est sorti que s'il avait été formé avec le limon de la terre.

Et quia forma, et finis, et agens incidunt in idem numero, vel specie, ideo etiam in ordine causae efficientis introductio formae prior est : quia forma prior introducta, est similitudo formae agentis, per quam agens agit : et similiter in ordine causae finalis ; quia natura principaliter intendit introductionem formae, et ad hanc ordinat expulsionem omnis eius cum quo non potest stare formae introductio [1].

L'acte divin que nous requérons pour la formation du premier corps humain n'est pas un miracle. C'est que la création de l'homme, comme la création du monde, n'est pas un miracle. La création pose les natures et leurs lois ; le miracle dépasse ces lois. Toute notre intention a été justement de montrer que la création de l'homme comprend, de par une nécessité métaphysique, cette double action divine : la création de l'âme et la formation d'un corps proportionné à cette âme, que Dieu se serve ou non pour cette formation, d'une matière animale préexistante.

L'évolutionnisme anthropologique ainsi compris est possible ; je reconnais qu'ainsi compris, il perd tout intérêt pour ceux qui s'en font une arme contre la saine philosophie et contre la foi ; mais le savant consciencieux n'en est point gêné ; il garde une pleine liberté dans ses recherches. Qu'il fasse son métier de savant. On lui demande seulement de ne pas faire de mauvaise philosophie.

Charles Boyer, s. j.

1. S. Thomas, *In IV Sent.*, dist.17, q.1, a.4, sol.1.

The Position of Modern Theology on the Evolution of Man

The suggestion that man originated by way of a process of evolution has had the most diversified impact in the area of religion on the experts in both science and theology.

Among the scientists Charles Darwin was lead by his convictions on the evolution of man to a disbelief in God, or at least to agnosticism. "I think," he wrote, "that generally (and more and more as I grow older) but not always, that an Agnostic would be the more correct description of my state of mind." [1] In another letter he reveals the source of his doubts. "But I may say that the impossibility of conceiving that this grand and wondrous universe with our conscious selves, arose through chance, seems to me the chief argument for the existence of God ; but whether this is an argument of real value, I have never been able to decide." [2] He thought that his own theories dispensed with the need of a Creator, and weakened the arguments brought forth in proof for the existence of God.

Lecomte Du Noüy, on the other hand, drew evidence for the existence of God from his views on evolution. As Pierre De Saint-Seine puts it : "In the order of human causes, it is his vision of evolution that lead him to the vision of God." [3]

Among theologians the claim that man originated on this earth through a process of evolution from lower animals evoked a welcome response from Cardinal Liénart, of Lille, while it provoked the indignation and heated attack of Cardinal Ruffini.

"Among the discoveries of which science is justly proud," wrote Cardinal Liénart in 1947, "those made in Geology and in Paleontology especially within the last half century rank among the most outstanding." After a brief summary of the reconstruction of "pre-history" according to these experts, he concludes that for Paleontology

> the occurrence of evolution, that is to say the passage from one species of life to another, and, consequently, the animal origin of the human body, is now considered a fact settled once for all. At the time of the "Conference on Paleontology" which in the month of April of this year brought together in Paris the leading authorities in Paleontology and in Biology from France, England, America and Switzerland, all without distinction of philosophical leanings were unanimous on this point. [4]

1. *The Life and Letters of Charles Darwin*, New York, D. Appleton, 1896, T.I, p.274.
2. *Ibid.*, p.276.
3. *Études*, 255 (1947), p.381.
4. *Le chrétien devant les progrès de la science*, in *Études*, 255 (1947), p.289.

Cardinal Liénart then proceeds to show how the teaching of evolution can be fitted into Catholic thought safely and fruitfully.

In sharp contrast with this enthusiastic welcome of Cardinal Liénart, Cardinal Ruffini has nothing but scathing denunciation. In a feature article written for the Vatican newspaper, the *Osservatore Romano*, June 3, 1950, he expresses deep concern and alarm at the favor with which some Catholics view the claims of evolution, and proposes vigorous arguments against evolution. For him not only have the upholders of evolution failed to bring forward one convincing proof, but their proposal is directly opposed to Catholic doctrine.

The arguments brought forth so far, he claims, have failed completely to disturb the Christian conviction based on Scripture, the teaching of the Fathers and the ever constant traditional teaching of the Church as set down in the Catechism. He contends further that the doctrine of evolution jeopardizes the fundamental truths of Christian faith on the perfections and position of Adam as the head of the human race, on Original Justice and on Original Sin. Finally he fears that the acceptance of evolution will open the door to a general breakdown of faith. [1]

The fact that Cardinal Ruffini published his article in the *Osservatore Romano* was taken by a few as indicative that he acted as the spokesman of the official stand of Rome. It is interesting to note, however, that a little more than a month after Cardinal Ruffini uttered his fervent plea to Catholics to shun the theory of evolution in order to safeguard the true faith, Pope Pius XII issued his encyclical *Humani Generis*, which appears to speak in a much calmer and conciliatory fashion, certainly with none of the alarm or condemnation of Cardinal Ruffini. I shall speak of this document in detail later. I think we shall see that the Sovereign Pontiff pursues a middle course between the enthusiastic welcome of Cardinal Liénart and the outraged rejection of Cardinal Ruffini.

I should like to engage in a brief, critical examination of the problem of the evolution of man in the light of the various sources of theological thought. For this purpose I propose to scrutinize developments in the Magisterium of the Church, Scriptural and Patristic studies, and the teaching of theologians. Before beginning this task, one point needs to be set forth in all clarity. This is not intended as a contribution to the arguments in favor of the evolution of man from the lower animal. This alone is intended ; to disengage the problem, if possible, from some elements in the field of theology that throw shadows of darkness rather than rays of light on the way to the solution.

1. Consult also Cardinal Ruffini's : *La teoria dell' evoluzione secondo la scienza e la fede*, Roma, Orbis Catholicus, 1948.

I. THE MAGISTERIUM OF THE CHURCH

It is a well known fact that toward the close of the last century the Holy See willed that Catholics should not teach or write in favor of the evolution of man's body. The action of Rome with regard to a book published in 1891 by the French Dominican, Père Leroy gives ample evidence of this. In 1896 a distinguished and learned priest of the Congregation of Holy Cross at Notre Dame, John A. Zahm, published a book entitled, *Evolution and Dogma*. Two years later, in 1898 the Sacred Congregation of the Index decreed that this book should be placed on the Index of Forbidden Books, but withheld promulgation of the decree on the condition that the author would withdraw his book from public sale. [1]

This action on the part of the Holy See does not mean necessarily that the Church officially and categorically condemned the theory of evolution. The prohibition could have meant simply that Rome judged these books unsafe and dangerous to the faith either because of the spirit of the times, or because of the manner in which the ideas were presented.

Well known, too, are the decrees of the Biblical Commission issued in 1909 on the interpretation of the Book of *Genesis*. One of these decrees merits particular attention here, namely the answer of the Commission to the question whether the literal historical meaning of the text of *Genesis* on the *special creation* of man, the formation of the first woman from the first man, and the unity of the human race can be called into doubt. The Commission answers in the negative.

Theologians have given various interpretations to this decree which insists that *Genesis* teaches the " special creation " of man. For some the Commission forbids the insertion of any evolutionary process at all in the inspired account of man's origin. They stress the fact that the Commission speaks of the special creation of *man* (" peculiaris creatio hominis "), the whole man, that is, and not merely the soul of man. For others the will of the Commission would be obeyed provided it be admitted that God intervened immediately in the final adaptation of the body to the human soul within a process of evolution.

A letter of J. M. Voste, O.P., secretary of the Pontifical Commission for Biblical Studies to Cardinal Suhard on January 16, 1948 seems to favor the second alternative. The writer points out that the pronouncements of Rome such as that of the Biblical Commission of 1909 " by no means block the way to a further, truly scientific investigation of these problems, in accord with the findings of the past forty years." [2]

1. As authoritatively stated by M. CIGOGNANI, O.P., secretary of the S.C. of the Index, in letters dated Sept. 10, 1898, and April 25, 1899, preserved in the archives of the Generalate, Congregation of Holy Cross.

2. *A.A.S.*, XL (1948), pp.46ff.

Pope Pius XII in an address to the Pontifical Academy of Science, November 1941, reaffirmed the common teaching of the Church on : 1) the essential superiority of man over the brute animal by reason of his spiritual soul ; 2) the derivation of the body of the first woman from the first man ; 3) the impossibility of the true father of a man being any other than a man.

He thereupon declared that science has yet to produce convincing proof that the body of man had its origin from a brute animal : " The many researches conducted in the field of paleontology or of biology and morphology have not yet furnished any positively clear and certain evidence bearing on other problems respecting man's origin." Then in well guarded words the Holy Father expresses the hope that science may some day help to solve the problem one way or other : " Therefore we can only leave to the future the answer to the question whether science, illuminated and guided by revelation, may some day be able to present secure and definite results with regard to so important a subject." [1] Notice, he does not say, in fact he explicitly denies, that the problem and its solution is exclusively a matter of the investigation of science. But the Sovereign Pontiff does issue a warm invitation to science to bend every effort to solve the problem. He calls it an " important " problem. His words also appear to express his feeling of trust and confidence in the ultimate good judgment of scientists themselves.

In August 1950 the Holy Father issued his encyclical *Humani Generis*,[2] in which he again maintains that science has not yet proved the origin of man's body by way of a process of evolution. Nevertheless he permits, and indeed seems to welcome, freedom of research and discussion on the problem

> by experts as far as the present state of human sciences and sacred theology allows. However, this must be done so that the reasons for both sides, that is, those favorable and those unfavorable to evolution, be weighed and judged with the necessary gravity, moderation and discretion ; and let all be prepared to submit to the judgment of the Church to whom Christ has given the mission of interpreting authentically the Sacred Scriptures and of safeguarding the dogmas of faith.

Since the Pope holds that the origin of man has not yet been definitely settled, and that possibly science enlightened and guided by revelation may one day come up with the answer, and that the answer conceivably might be that man's body did evolve from the lower animal, he must mean to say that theologians on their part have not definitely disproved the possibility that man's body did originate by way of evolution. Theologians may take this as a warning not to be too sure of themselves in their opinion on the matter.

1. *A.A.S.*, XXXIII (1941), p.506.
2. *A.A.S.*, XLII (1950), pp.561ff.

The Pope is addressing theologians as well as scientists when he warns that in discussions on the matter " the reasons for both sides, that is, those favorable and those unfavorable to evolution, be weighed and judged with the necessary gravity. "

In this same encyclical the Pope states emphatically that one element in this problem is beyond dispute, namely that the entire human race on this earth originated from one first human couple. Polygenism, therefore, is out of the question.

Throughout his pontificate Pius XII in the name of the Catholic Church has held out the hand of friendship to science. In his latest address to the Pontifical Academy of Science, November 1951, [1] he spoke of the pleasure with which he honored the scientists gathered before him :

> For, by your research, your unveiling of the secrets of nature, and your teaching of men to direct the forces of nature toward their own welfare, you preach at the same time, in language of figures, formulae, and discoveries, the unspeakable harmony of the work of an all-wise God.
>
> In fact, according to the measure of its progress, and contrary to affirmations advanced in the past, true science discovers God in an ever-increasing degree — as though God were waiting behind every door opened by science . . .

There are no doubt today many scientists whose very method of seeking truth has closed the door to God for them, as in the case of Charles Darwin. But an atheistic or agnostic attitude is not the badge of the true scientist. Many scientists such as Lecomte du Noüy justify the Pope's words of praise.

In the judgment of the Holy Father, modern scientific discoveries and theories add new strength to the proofs for the existence of God : " But if the primitive experience of the ancients could provide human reason with sufficient arguments to demonstrate the existence of God, then with the expanding and deepening of the field of human experiments, the vestiges of the Eternal One are discernible in the visible world in ever more striking and clearer light. " Further on the Pope amplifies this statement :

> From these ' modes of being ' of the world around us which, in greater or less degree of comprehension, are noted with equal evidence by both the philosopher and the human mind in general, there are two which modern science has, in a marvelous degree, fathomed, verified, and deepened beyond all expectations : 1) the mutability of things, including their origin and their end ; and 2) the teleological order which stands out in every corner of the cosmos . . . To the first way [of St. Thomas in proof of the existence of God] physics, especially, has provided an inexhaustible mine of experiments, revealing the fact of mutability in the deepest recesses of nature, where previously no human mind could ever even suspect its existence and vastness. Thus physics has provided a multiplicity of

1. *A.A.S.*, XLIV (1952), pp.31ff.

empirical facts, which are of tremendous assistance to philosophical reasoning. We say 'assistance,' because the very direction of these same transformations, precisely in view of the certainty afforded by physics, seems to Us to surpass the value of a mere confirmation and acquires almost the structure and dignity of a physical argument which is in great part new, and more acceptable, persuasive, and welcome to many minds.

With similar richness other sciences, especially the astronomical and the biological sciences, have in our own day contributed to the argument from order such a vast array of knowledge and, so to speak, so stupefying a vision of the conceptual unity animating the cosmos, and of the teleology directing its movements, as to anticipate for modern man the joy which the Poet imagined in the empyrean heaven . . .

The Pope here draws a picture of the cosmos which from its beginning has been in dynamic movement, a movement evolving its potentialities, a movement not haphazard but teleologically directed. We must resist here any tendency to read between the lines, or to make the Pope say anything beyond his intentions. However, while the Pontiff gives no indication that he has in mind an organic as well as an inorganic evolution, yet his words could be taken as giving great comfort to those philosophers for whom an organic evolution reaching its supreme success and purpose in man, if proved to be a fact, would greatly enrich the integral concept of the philosophy of nature.

The Pope goes on to say that modern science has made important contributions toward establishing the age of the earth. He sketches briefly the methods by which modern science basing its calculations on radioactive material has been able to ascertain the age of the earth as being something around five thousand million years. The human mind, the Pope continues, enlightened and enriched with modern scientific knowledge with the

same clear and critical look with which it examines and passes judgment on facts, perceives and recognizes the work of creative omnipotence, whose power, set in motion by the mighty 'Fiat' pronounced thousands of millions of years ago by the Creating Spirit, spread out over the universe, calling into existence with a gesture of generous love matter bursting with energy. In fact, it would seem that present-day science, with one sweeping step back across millions of centuries, has succeeded in bearing witness to that primordial 'Fiat lux' uttered at the moment when, along with matter, there burst forth from nothing a sea of light and radiation, while the particles of chemical elements split and formed into millions of galaxies.

Using this same method of measurement of radioactivity approved by the Pope, science has succeeded in estimating with fairly accurate approximation the age of the fossil remains of "pre-historic" man. Man is now known to have inhabited the earth many thousands of years longer than the theologians of old ever dreamed.

Unless I am mistaken, these newly acquired facts on the age of the earth and of man radically change the perspective of the world

from which older theologians reasoned, and remove, perhaps, one of the major props on which they relied in their " fixism."

In his encyclical *Divino Afflante* of September 1943, [1] Pius XII sets forth directives for the correct interpretation of Sacred Scripture. He severely warns those devoted to this work that they must acquaint themselves with and make use of the wealth of information uncovered in modern times. Scientific studies on the monuments of antiquity throw important new light on many passages of Scripture.

The learned scholars of the early Christian ages did not complete the work of exegesis. Not at all. Much remains undone, and the modern student has the opportunity and the means to carry on this work, for " our times have brought to light many things which call for a fresh investigation and a new examination, and which stimulate not a little the practical zeal of the present-day interpreter."

The Pope then calls attention to the difficulties confronting the serious scholar :

> Frequently, the literal sense is not so obvious in the words and writings of ancient oriental authors as it is with the writers of to-day. For what they intended to signify by their words is not determined only by the laws of grammar or philology, not merely by the context : it is absolutely necessary for the interpreter to go back in spirit to those remote centuries of the East, and make a proper use of the aids afforded by history, archeology, ethnology and other sciences, in order to discover what literary forms the writers of that early age intended to use, and did in fact employ. For to express what they had in mind, the ancients of the East did not always use the same forms and expressions as we use to-day ; they used those which were current among the people of their own time and place ; and what these were the exegete cannot determine a priori, but only from a careful study of ancient oriental literature. This study has been pursued during the past few decades with greater care and industry than formerly, and has made us better acquainted with the literary forms used in those ancient times, whether in poetical descriptions, or in the formulation of rules and laws of conduct, or in the narration of historical facts and events. . .
>
> No one who has a just conception of Biblical inspiration will be surprised to find that the sacred writers, like the other ancients, employ certain arts of exposition and narrative, certain definite idioms, especially of a kind peculiar to the Semitic tongues . . ., and certain hyperbolic and even paradoxical expressions designed for the sake of emphasis. The Sacred books need not exclude any of the forms of expression which were commonly used in human speech by the ancient peoples, especially of the East, to convey their meaning, so long as they are in no way incompatible with God's sanctity and truth . . .

Ernest Messenger in his recent book, *Theology and Evolution*, [2] hails this encyclical as " one of the most important ever issued by the Holy See. It is noteworthy, in the first place, because, for the

1. *A.A.S.*, XXXV (1943), pp.297ff.
2. *Theology and Evolution*, The Newman Press, Westminster, Md., 1952, p.183.

first time, we have, so to speak, an official Pontifical approbation of the theory that there are diverse ' literary forms ' in Holy Writ."

In the light of the Pope's warning on the peculiarities in the mode of expression of the writers of Sacred Scripture, I question the value of the arguments against evolution often times found in manuals of Sacred Scripture. Consider a few samples. The first chapter of *Genesis* has : " God created man to His own image ; to the image of God He created him ; male and female He created them." Authors then draw attention to the fact that the Hebrew text has the word *bara* for " created," that *bara* is repeated three times, and that this Hebrew word is employed exclusively for God's activity. Could not one justly answer this kind of argumentation with the saying : " Quod gratis asseritur, gratis negatur " ?

The second chapter of *Genesis* has : " And the Lord formed man of the slime of the earth ; and breathed into his face the breath of life, and man became a living soul." The Hebrew text has *nephesh haja* for " living soul." Authors whose validity of argumentation from Scripture is here questioned point out that in Hebrew usage " *nephesh haja* " *always* designates sense life. They conclude that the author of *Genesis* affirms that the body formed by God received sense life at the same time that it received truly human or intellectual life, and that he thereby excludes any idea of an evolutionary process. This argument would stand up well if the author of *Genesis* wrote with the precision of language of modern philosophy, but it loses much of its force, when one considers the warnings of the Pope on the difference in the manner of expression between the ancient Semitic writers and writers of our own time.

In order to win the co-operative effort of scholars from many fields, the Pope appeals to the good will of all and to their mutual understanding :

> Let all the other sons of the Church bear in mind that the efforts of these resolute laborers in the vineyard of the Lord should be judged not only with equity and justice, but also with the greatest charity ; all, moreover, should abhor that intemperate zeal which imagines that *whatever is new should for that very reason be opposed and suspected.*

Is there not the danger of condemning outright the very suggestion that man's body originated by way of a process of evolution simply because it is new, simply because the frame of mind which we inherited from our Christian past does not include the notion of evolution ?

II. SACRED SCRIPTURE

The Scriptural teaching of the origin of man does not give even the least hint of any evolutionary process. The story of man's first appearance on earth as sketched by Moses suggests no time interval

between " slime of the earth, " or inanimate matter and living, human body. The whole question, then, centers on this point : does the account given by Moses tolerate the interpolation of an evolutionary process ? Does the author of *Genesis* intend to exclude a stage or stages in which the " slime of the earth " would pass through lower forms of life before it was endowed with the immortal, human soul ? In other words, is the meaning of the text which is the *obvious* one *to us now reading it*, the strictly *literal* one intended by Moses ?

The instruction of Pope Pius XII on the interpretation of Scripture and its difficulties ought to put us on guard against deciding glibly and readily. Will we say that we cannot allow a time interval where Moses indicates none ? The comments of Cardinal Liénart merit attention here. The events

> of the kind met with in the Bible, writes the Cardinal, have this peculiarity that they hardly take into account space and time — matters to which science attaches so much importance. Its way of localizing and of dating is generally vague, more schematic than real, at times even non-existent. The most typical example of this sort of thing is that of the prophecies which project the most diversified perspective of the future on the same plane : in the Old Testament, for example, the return from captivity, the coming of the Messiah and the end of the world ; in the New, the destruction of Jerusalem and the second coming of the Saviour. One might say that the word of God coming down from the region where time does not exist wills to disregard it. In any case it can be seen from this that the Bible does not dispense us from pursuing our inquiry in the domain of science, and provides us with meager information on this point. [1]

These words of the eminent cardinal are pertinent to the problem at hand. If the divinely inspired writers in other passages of Scripture either entirely ignore or foreshorten intervals of time, we can readily rule out the possibility that the author of *Genesis* is describing the origin of man disregarded the time element ?

Some students of history believe that the unfortunate clash between Galileo and some of the members of the Italian clergy was caused more by the friction of personalities than by anything else. Galileo, it appears, talked down to the theologians and haughtily assumed the attitude of teaching them Sacred Scripture. Naturally this aroused the resentment of the theologians and hardly put them in the frame of mind to appraise dispassionately his views on natural science.

If the present dispute presents a similar situation the words of the Holy Father already quoted ought to help to dispel it. He makes a strong appeal for the close and cordial co-operation between students of Sacred Scripture and men of science for progress in the better understanding of the inspired word of God.

1. *Art. cit.*, in *Études*, 255, p.294.

Were it true that there prevails a real disagreement and a genuine contradiction in the teaching of the experts in science and the experts in Scripture interpretation, then this ought to be an occasion for each side to be diffident of its own views and to reexamine its position. The natural sciences and the science of interpretation of Sacred Scripture are each autonomous ; each has its own principles, sources of information, methods and " certitudes. " Neither has the right to invade the precincts of the other. Nevertheless each can learn from the other. Above all each can profit from a clash of views to assert as a fact only that for which they have sufficient evidence.

Both sides should read and reread the words of the Vatican Council :

> Although faith is above reason, faith and reason can never really oppose each other, for the same God Who reveals the mysteries and infuses the faith has given the light of reason to the human mind. God can neither negate nor contradict Himself. The appearance of a contradiction, therefore, does not rest on a firm foundation, but in general has its origin either from this fact that the dogmata of faith have not been understood and expounded according to the mind of the Church, or, on the other hand, from the fact that a crop of opinions has been taken for the dictates of reason. [1]

Rightly the student of Scripture holds that the divinely inspired word of God is too sacred to be tailored to the style of the whim and the fancy of the day. Lest he be found guilty of imprudence, he demands serious reasons for abandoning the obvious sense of what he reads in Holy Writ.

On the other hand, science in all of its branches can help the Scripture scholar to find these " serious reasons, " as the Pope insists. The Pontiff acknowledges that science has already opened up new horizons and perspectives in regard to the age of the earth. I dare not think what St. Jerome or Suarez in their day would have said of the proposal that the earth was about five thousand million years old. What would have been the reaction of St. Augustine who wrote : " They are deceived, too, by those highly mendacious documents which profess to give the history of many thousand years, though, *reckoning by the sacred writings*, we find that not 6,000 years have yet passed. " [2]

Science, too, using the same methods of time-calculation to which the Pope attaches no little value, has given us new perspectives on the age of man. What must those theologians say to this who have argued *a priori* that the human race could have existed only a few thousand years, since the goodness of God would not make man await more than that for the coming of his Redeemer? Science may

1. Session III, chap.4 (Denz.1797).
2. *De Civitate Dei*, Bk.XII, chap.10.

exert a wholesome influence in stirring some theologians out of other sheer *a priori* reasoning and self-complacent thinking.

While some Scripture scholars may be at fault occasionally in being too slow to discard age-old and habitual ways of understanding certain passages in Holy Writ despite the evidence calling for such a change, some scientists, and some theologians influenced by them, are, perhaps, a little too eager for change. In his encyclical *Humani Generis* the Pope spoke out sharply against those " who hanker too much after novelties and who dread being thought ignorant of the latest scientific findings. Tending to withdraw from the guidance of the sacred Magisterium, they are in danger of gradually losing revealed truth and of drawing others along with them into error."

I do not mean in the least to imply that the theologians who favor evolution are guilty of the extreme love of novelty, harmful to the faith, which the Pope roundly condemns. Yet some of these theologians seem to be overly impatient in their attitude toward the conservative group. The late Ernest Messenger in his recent book, *Theology and Evolution* — a sequel to his *Evolution and Theology* published in 1931 — speaks of the " decidedly intransigent attitude adopted by those American Jesuits who have written on the matter, and the equally ultra-conservative attitude adopted by some theologians nearer home. " He speaks with pride of the part he has played in overcoming the opposition. Then he adds, " It must be admitted that, even so, the battle is not entirely won, and there is still some ' mopping up ' to be done. There still exist some theologians who are resolutely opposed to the idea of the evolution of man . . ." [1]

In these words there seems to lurk a note of scorn for those theologians who have not yet been won over. He shows evidence of wanting to stampede theologians into the acceptance of man's origin by way of evolution. Theologians are behind the times, outmoded, who do not subscribe to this view. Yet, not even all scientists ardently support evolution.

Yesterday, as part of their contribution to this symposium, professors Ludwig von Bertalanffy and W. R. Thompson not only manifested little enthusiasm for the idea, but said that in their judgment scientists were making entirely too much of the theory of evolution. Professor Thompson criticized severely the very foundations upon which the theory has been made to rest. Granted that these are but a few among a vast number of scientists who hold an entirely divergent view. [2] That makes little or no difference here. Is a

1. *Op. cit.*, p.173.

2. Richard B. Goldschmidt wrote recently : " Evolution of the animal and plant world is considered by all those entitled to judgment to be a fact for which no further proof is needed " (Article in *American Scientist*, Vol.40, n.1, p.84). In this he reflects the confidence, it seems to me, of the vast majority of scientists.

theologian to be despised for not joining the crowd, holding himself aloof, wanting a little more evidence?

If the words of the Pope in *Humani Generis* on freedom of discussion mean anything, they teach that neither should the theologian who favors evolution be judged by that fact suspect of heresy, nor should the theologian who for good reasons holds to the older view be judged guilty of sterility in theological thought.

III. THE FATHERS OF THE CHURCH

The Holy Father holds to the mean between the unbridled love of novelty and the blind resistance to new ideas. Remember, he warned that all " should abhor that intemperate zeal which imagines that whatever is new should *for that very reason* be opposed or suspected. " Could one oppose the interpretation of *Genesis* according to the theory of evolution not simply because it is new, but for the reason that it stands against the common teaching of the Fathers?

The Vatican Council declared that :

> that is to be held as the genuine meaning of Sacred Scripture which Holy Mother Church held and holds. Hers is the office of passing judgment on the true meaning and interpretation of the Sacred Scriptures. It is not permissible, therefore, to interpret the same Sacred Scripture contrary to this meaning, or contrary to the unanimous consent of the Fathers. [1]

Now, one can quite easily marshall together a formidable array of texts from the Fathers in which they say that God formed the living human body from " dust " or the " slime of the earth." Most, if not all of the Fathers, express themselves in such a way as to clearly indicate that they thought that the human body was formed immediately from inanimate matter. Do we have here a clear case of the " unanimous consent of the Fathers " so determining the meaning of a given passage of Sacred Scripture that it would not be safe to hold the contrary? The Church in its official stand certainly does not think so, since it permits scholars and experts today to question the true and literal meaning of the passages in Scripture touching on the matter.

If we look now for the reason why the interpretation of these passages has not been definitively established by the writings of the Fathers, in spite of the fact that there appears to be almost unanimity in the manner in which they understood the passages, the following reasons come to mind.

First, the very unanimity of the thought of the Fathers in this matter does not stand with absolute certainty. I do not mean to suggest that the concept of a process of evolution such as is proposed

1. Session III, chap.2 (Denz.1788).

today ever entered the mind of any Father of the Church. But that aside, the Fathers were not in absolute agreement in what actually did take place. No matter what side one may take on the controversy concerning what St. Augustine really meant by his " rationes seminales " and other cognate ideas, or what St. Gregory of Nyssa wanted to say in his account of creation and the origin of living things, the probability is there that these two Fathers departed sufficiently from the obvious sense of the Scripture passages as to lay open the way for an interpretation in the modern conceptual pattern of evolution.

Secondly, it is open to question whether the Fathers meant to teach the immediate production of the human body from inanimate matter as the one and only literal sense intended by the divinely inspired writer. Neither Scripture nor the Fathers meant to give a scientific explanation of the innermost structure of the physical world. Closer examination of the texts of the Fathers reveals that they spoke simply in the language of Scripture itself, and quite naturally thought along the lines of the obvious sense of the language employed. None other but the obvious sense occurred to them. All the evidence points to this that they were not inculcating as a matter of faith the obvious meaning of the passage. Furthermore, the objectives for which they were writing would not be hindered at all by our substitution of an evolutionary process in place of an immediate production in their train of thought about the origin of man. As far as the Fathers were concerned, what difference did it make whether man owed his existence to God in one way or the other. In any case man is from the " dust " of the earth, man owes all that he is, and all that he will ever be to the almighty power and love of God.

Even if the Fathers had known and accepted the theory of evolution, they might have ignored it and foreshortened the process, as a Catholic priest might do today in the pulpit notwithstanding the fact that he is an ardent advocate of evolution. As far as the truths necessary for salvation are concerned, what difference does it make ?

IV. CATHOLIC THEOLOGIANS

The Angelic Doctor, St. Thomas, whom the Church proposes as the master of all theologians, rejected the view that God used the instrumentality of any created power when He fashioned the body of the first man : " prima formatio humani corporis non potuit esse per aliquam virtutem creatam, sed immediate a Deo. " [1]

St. Thomas, of course, was not aware of the problem of the possibility of man's body originating by way of a process of evolution as it is proposed today. Nevertheless the positive position that he takes on the action of God in the formation of the human body leaves

1. *Summa theologiae*, I, q.91, a.2, c.

little or no doubt that he excludes evolution. [1] For him the transformation that took place surpassed the order of nature and required the action of the divine power alone : " quae fiunt praeter naturae ordinem, et sola virtute divina, sicut quod mortui resuscitantur, quod caeci illuminantur ; quibus est simile, quod homo ex limo terrae formatur. " [2]

One may question the deductive value of the argument of St. Thomas in the matter ; one might discuss the relative play of his theological, philosophical and physical concepts in determining his position ; one might ask whether he would still maintain that God made use of no creature as an active medium in the formation of the body of the first man, if he had the scientific information we possess today. But there can be little or no doubt that the position he actually took is tantamount to a rejection of evolution.

The Angelic Doctor does admit that the angels could have acted as ministers of God in the formation of the first human body by " pulveres colligendo. " [3] He fails to clarify his meaning here. But it appears to be beyond his thought, if not contrary to it, to interpret this to mean that an angel or any power within created nature " gathered the dust " by organizing the body, giving it the proximate disposition for the human soul. This is sufficiently evident from the body of the same article where he affirms that it is not fitting for a separated substance to accomplish what the parent does in procreation.

When the modern form of evolution founded on some semblance of scientific evidence was proposed in the last century, theologians almost to a man rejected it insisting with St. Thomas that God immediately formed the body of the first man from inanimate matter. Within recent years there has been a considerable break in the ranks. In 1944, Thomas Motherway, S.J., took a sampling of current theological opinion and concluded that

> many very respectable authorities among the theologians consider it allowable to hold that the matter which God used in producing Adam's body may have been living matter, even the body of a brute animal. These authorities in general do not positively maintain that God used the body of an animal, but they do not see that such a stand should be prohibited to scientists. [4]

There is no evidence that the balance of opinions on the matter has changed appreciably since Motherway's survey. It would be safe to say that at least 50 percent of the theologians in this country and abroad remain steadfast in their opposition to the suggestion that the

1. *Ibid.*, c.; ad 1.
2. *Ibid.*, ad 3.
3. *Ibid.*, ad 1.
4. *Theological Studies*, V (1944), 219.

body of the first man had its origin by way of evolution. It would be useless to hazard a guess how much this attitude depends on the weight of the authority of St. Thomas whose reasoning on this question does not appear to be apodictic. No doubt some prefer to follow an opinion of St. Thomas rather than the opinion of someone proposing the contrary view.

But prescinding from this element of filial loyalty to St. Thomas, we can note three different sources from which theologians draw their opposition to evolution : 1) the fear that the barrier against materialism and atheism will be weakened, if it be admitted that man's body originated from a lower animal ; 2) the judgment that the arguments of scientists in favor of evolution are inconclusive and invalid ; 3) the conviction that the analogy of faith cancels out the possibility of evolution, that is, that the theory of evolution is incompatible with certain dogmatic truths.

A brief, critical examination of each of these sources seems necessary.

1) The first source of opposition to evolution has been eloquently expressed by Cardinal Ruffini :

> Materialists of all shades have gladly taken hold of the theory of evolution in the hope of explaining the universe without recourse to the power, the wisdom, the goodness of God. Nor have they held back before man who in all that he is — according to them — enters into the endless series of products of the evolving material cosmos. Catholics, naturally, have not given their adherence to claims as radical as these. Nevertheless, a certain one in France — and not one of the less representative — was drawn to this that he was confused about the borderline between matter and spirit, and finally to this extreme that he doubted about the existence of any line of demarcation. See how strong is the logic of things ! Once the beginning is made, it is extremely difficult to limit its consequences, even the least foreseen, even the least desired. To tamper with the origin of man by modifying and changing the ancient belief, is to make an opening that could lead to the weakening of the most important positions of our faith, if not to outright error. [1]

With all due respect to his Eminence, this seems to be an appeal more to the emotions than to reason. Abuse does not justify rejection *in toto*. If some use the theory of evolution as a wedge to overthrow the true Faith, that is no proof that the theory itself is false. The enemies of the Church have used and still use truths taught by the Church cleverly twisting them so as to turn men's minds and wills against the Church. The Cardinal would certainly not ask us to deny these truths of faith in order to avoid the embarrassment they may cause us in some quarters. Neither can we deny any truth of fact for the sake of protecting the faith. Ignorance does not serve the life of faith.

1. *L'Osservatore Romano*, 3 Giugno, 1950.

2) The second source from which many theologians draw their opposition to evolution is what they think to be the weakness in the arguments brought forth by scientists in support of it. With comparative ease they demolish to their own satisfaction the so-called evidences of man's evolution from the lower animal which serious and careful experts in the fields of paleontology, comparative anatomy, genetics and the like, accept as establishing a strong probability that this is the way actually man's body originated.

Evidence is always weak to one who has already made up his mind to hold the opposing view. The story is told that a member of the clergy in Italy refused Galileo's invitation to look through his telescope and observe heavenly bodies hitherto unseen by the naked eye. The clergyman — so the story continues — refused to look, saying that heavenly bodies invisible to the naked eye could not exist, since Scripture teaches that God made the earth and the sky for man, and mankind could not have been deprived of the use of these heavenly bodies in order to glorify God through them. This story may lack entirely historical basis, but, as the Italians say, *se non è vero, è ben trovato*. True or false it teaches us a valuable lesson. Our *a priori* reasonings from some passage or other of Scripture may at times be much weaker than we think.

We theologians ought to be very careful in our evaluation of the work done by scientists. The expert in science has a method and an ability to appraise critically his own findings for which many theologians lack competence entirely. The theologian's inept handling of matters that belong properly to the scientists may arouse the contempt of the latter for the whole profession of theology. [1] On the other hand, it is worthy of note that those theologians who are also well trained in science, and particularly those who themselves have pursued some scientific investigations are less prone than others to completely reject the claim of man's origin by way of evolution.

When Pius XII wrote in his encyclical, *Humani Generis*, that it is permissible for the experts to investigate and discuss the problem of evolution, he added the caution that " this must be done so that the reasons for both sides, that is, those favorable and those unfavorable to evolution, be weighed and judged with the necessary gravity, moderation and discretion . . . " There is no indication that this is to be taken as a warning to scientists but not to theologians.

3) The third and major source of the opposition of many theologians to evolution is that it appears to be out of harmony with other known truths, truths of faith. Those theologians who voice strong opposition believe that evolution even in the moderate form which restricts the process of the formation of man's body is incompatible

1. In this connection read St. Thomas, *Summa Theol.*, I, q.68, a.1, the opening sentences.

with Scriptural and dogmatic truths. Their arguments, in general, have three chief points of departure : *a*) the formation of the first woman from the first man ; *b*) the unity of the human race required for the dogma of Original Sin and Redemption ; *c*) the singular perfection of the first man created in the state of justice.

A few words of comment on each of these points.

First, it seems absolutely certain theologically that the body of the first woman was immediately formed by God from something taken from the already existing first man. The documents of the Church quoted some time back insist on this.

Further, not only does the immediate context of *Genesis* appear to bar the figurative sense, but other texts of the Old and New Testament lay stress on the obvious and literal meaning of the text. *Genesis* itself draws the conclusion from the obvious sense to the divine institution of marriage : " She shall be called woman, because she was taken out of man. *Wherefore* a man shall leave father and mother and shall cleave to his wife . . . " St. Paul also draws from this the important Christian moral teaching on the authority of husband over wife, and the love he must have for his wife. [1]

The Scripture scholar Ceuppens, O.P., was so impressed by the force of this text on the origin of Eve that he wrote : " It appears to exclude the hypothesis of evolution in any form. " [2] This stand is all the more remarkable because mature consideration of this text seems to have influenced Ceuppens to retract a view he had previously held to the effect that Scripture could not solve the problem of evolution one way or other. [3]

The direct and immediate intervention of God in forming the body of the first woman from something taken from the first man raises problems of the following nature for the entire hypothesis of the evolution of man. From the point of view of sound Scriptural interpretation : if the obvious and literal meaning of the inspired text is required in the passage on Eve's formation, does not consistency require that the passage of Adam's origin be taken in the obvious and literal meaning of the words used ? One ought to agree, so it seems, that parallel texts in the one same context should be interpreted in the same fashion : either both in the obvious sense, or both in some other sense, unless there were good reason for doing otherwise. But that is the whole question here. Is there good reason for abandoning the obvious sense in the passage on Adam's origin ?

1. A. Jones in his book, *Unless Some Man Show Me*, Sheed and Ward, New York, 1951, p.95, presents an excellent argument from Scripture.

2. F. Ceuppens, O.P., *Genese I-III*, 1946, p.137.

3. F. Ceuppens, O.P. : " Whether or not that organic, living matter was a living animal is a question that belongs not to exegesis but rather to anthropology " (*De Historia Primaeva*, 1934, p.133).

But the problem presses from still another angle : if God chose to form the body of the first human female without the instrumentality of lower animals, would not consistency of purpose suggest that He refused the instrumentality of animals in the origin of the first human male? Scripture itself gives the answer why God chose to form the first woman from the first man, namely, to lay the foundation for the spiritual and moral laws of the husband-wife relationship, and for the unity of the human race. St. Augustine put it very well when he wrote :

> And human nature has nothing more appropriate, either for the prevention of discord, or for the healing of it, where it exists, than the remembrance of that first parent of us all, whom God was pleased to create alone, that all men might be derived from one, and that they might thus be admonished to preserve unity among their whole multitude. But from the fact that the woman was made for him from his side, it was plainly meant that we should learn how dear the bond between man and wife should be.

Further on, commenting on the text of Matthew, XIX, 4, 5 he says :

> It is certain, then, that from the first men were created, as we see and know them to be now, of two sexes, male and female, and that they are called one, either on account of the matrimonial union, or on account of the origin of the woman, who was created from the side of the man. [1]

One theologian proposes the following argument : If God immediately intervened in the formation of the body of the first woman, He must have done the same in the formation of the body of the first man, since man is at least the equal of woman in dignity. This sort of reasoning can be the ruination of theology. Arguments from what is " fitting " ought to be used with extreme care in theology. Often they are too subjective to be of any value. Who is to judge whether it is more in keeping with man's dignity that he be immediately formed from the " slime of the earth, " than mediately through a process of evolution up from the animal? Scripture nowhere appeals to woman's dignity when it says that God fashioned her body immediately from Adam. The inspired writers give an entirely different reason why God chose the way He actually brought the first woman into the world.

But the account in *Genesis* of the manner in which the first woman originated in this world leaves another difficulty in the path of the theory of evolution. If a process of evolution acting as instrument of the divine creative power succeeded in producing a man, why did it not also succeed in producing a woman? Or, to put it in another way, do the demands of Catholic theology strip so much from the hypothesis of evolution that it is useless to hold on to what is left? It is true that the Sources of theology force us to whittle down the theory

1. *De Civitate Dei*, Bk.XII, chap.27 and Bk.XIV, chap.22.

of evolution and to place radical limits on the potentialities of such a process if it did actually occur. Yet, the same Sources do not entirely wreck the theory. God did not use the instrumentality of animals in fashioning the body of the first woman, but by His immediate action He brought her body into existence out of something taken from the body of Adam, because He willed the human race to have a unity based on its origin from one man. For this reason He would have withheld His divine concurrence to the process of evolution striving to produce a human female, if there was such a process. On the other hand, God could very well have used the instrumentality of the animal in the production of the first man in order to establish a certain unity of man with the rest of earthly creatures.

If we are to believe the experts in Osteology and in Comparative Anatomy the skeletal design and the musculature of man point to his origin from an animal habituated to walking on all fours. These experts indicate certain areas in the spinal column of man, for example, which often cause trouble, and seem to show that it is not perfectly designed for the upright position assumed by man. These " defects " are found, of course, in woman's body as well as in man's. If the observations of these experts are true, do they conflict with the teaching of the Church that the first woman's body was not the immediate result of an evolutionary process? Not necessarily. Whatever it was that God took from Adam's side could have carried the hereditary determinants of bodily structure such as we know to be present in both the male and the female reproductive cells.

The second major theological truth which some theologians believe to be a serious obstacle to the theory of evolution is the genetical unity of the human race. The dogmata of Original Sin and of Redemption absolutely demand Monogenism. Pius XII in his *Humani Generis* voiced the common teaching of theologians when he said that in the light of revelation Monogenism is not open to question. No Catholic can defend Polygenism.

Does this dogmatic truth lessen the possibility or the probability of evolution? Not necessarily, at least for the form of the hypothesis that is theistic and finalistic, and admits God's directive influence in the process.

The demands of theology and the demands of science do not clash head-on here. Science can go no further than to show that nature has the potentialities of producing several first human couples ; but never that this actually happened. In the view consonant with Catholic theology God would have withheld His support to all save the one process that actually succeeded in bringing forth the one first man, and, in a way, the first woman.

The third major truth from which many theologians draw their opposition to evolution is the very perfection of the first man. The very first man on earth was certainly not a primitive man in the

ordinary sense of that word. He was more perfect in soul and in body than his descendants, more perfect than men today. At first glance, at least, the first man as represented in the sources of faith seems to be the very reverse of that which the theory of evolution would have him to be. This merits closer scrutiny.

Revelation teaches that God endowed the first man with such grace and holiness that his will was in perfect conformity with the divine will. In addition, the preternatural gifts of immortality and integrity brought about such perfection and harmony in his body that its condition far exceeded that which could be achieved through the powers of natural development.

Faith teaches, moreover, that Adam was not only the first man in time but also the first in the sense of responsible head of the human race. In some mysterious way Adam stood before his Maker as the representative of all mankind, to such an extent that his sin of insubordination to the divine will became the sin of nature and is passed on to all his children, the Immaculate Virgin Mary alone excepted by divine dispensation.

From all of this theologians concur with St. Thomas [1] in affirming that Adam must have had exceptional clarity of knowledge, that, in fact, his mind was perfected through infused knowledge. The first man, Adam, as pictured by St. Thomas, was the perfect, the ideal man.

Theologians argue from the perfections of Adam in the state of Original Justice and from his stature as the representative of the entire human race before the Creator that such must have been the mental and bodily perfections of Adam that they could not have been the adornment of a man who from the point of view of human nature was just a step above the order of the brute animal.

The almost bestial mien, the clouded intelligence commensurate with the primitive human brain at the dawn of its rise out of animality through evolution — so they argue — would ill befit one of the stature and dignity of Adam.

A close scrutiny into the facts of the case seems to force this conclusion : the hypothesis of man's origin by way of a process of evolution is highly improbable unless both the scientists who advocate evolution and the theologians who follow the Thomist ideas on the perfections of the first man yield some ground. Happily, so it seems, each side would have to yield only on unessentials.

Scientific evolution must agree that the first man enjoyed perfections of mind and body above and beyond any of his offspring. These perfections would be due, not to the processes of nature, but to the supernatural intervention of God.

Thomistic theology, on the other hand, would have to modify in some degree the sketch of the first man as drawn by the Angelic

1. *Summa Theol.*, I, q.94, a.3.

Doctor. It could do this by separating what St. Thomas presents as probable from what he establishes as certain by genuine demonstration. As far as the mere external, bodily appearance of the first man is concerned, this need not detain us. Did he resemble the brute animal more than modern man? What difference does it make for the truths of faith and of salvation? Furthermore, on what grounds can theology rely, if it wishes to settle the question, unless it be on what is fitting? But, then, it is pretty much a matter of conjecture. And then, too, does evolution require that the first man have a close bodily resemblance to the brute animal? Certainly, no matter what were the facial features of Adam, the light of supernaturalized intelligence and love shone through his eyes and gave him a mien far removed from a brutish face.

The question of the degree of intelligence of the first man is much more delicate and difficult. Does evolution demand what the sources of theology cannot give? Presumably, if the forces of nature alone were at work in a process of evolution, the intelligence of the first human being emerging from that process would be of a very low grade. But we know for a certainty that God did intervene, and that He enlightened the mind of Adam with supernatural truths, and that He endowed the will of Adam with an activity corresponding to that knowledge.

In the opinion of St. Thomas the first man, Adam, was endowed with such a high degree of knowledge of things on the natural plane that no increase through development was possible :

> The first man was established by God in such a manner as to have the knowledge of all those things for which man has a natural aptitude . . . The first man had knowledge of all things by divinely infused species. . . . Adam would have advanced in natural knowledge, not in the number of things known, but in the manner of knowing ; because what he knew speculatively he would subsequently have known by experience . . . [1]

St. Thomas thought that the position of Adam as father of all men whom he was to instruct and govern called for this supreme degree of human mental perfection. One might question whether the Angelic Doctor does not stretch to exaggerated limits the riches of intellectual knowledge possessed by our First Parent.

Is it not possible without doing serious harm to the general lines of his thought to restrict that perfection of mind on the natural plane and to allow for some development or evolution of human consciousness and intellection? Do the revealed truths concerning the perfection of the State of Innocence and of Adam's place in it require absolutely that the very first appearance of human intelligence be the highest attainable on earth?

1. *Ibid.*, a.3, c. and ad 1, 3.

It seems safe to say that there cannot be found really convincing reasons that rule out the possibility of development on all levels of human thought and intelligence. Growth seems to be the very law of life. God has willed it so. The very dynamics of human existence on earth seems to oppose the aprioristic view of St. Thomas. At least we have some good reason to suspect that some of the riches of human understanding and human consciousness may have existed only potentially in the mind of Adam to be actualized through the efforts of his offspring throughout the ages that succeeded the First Parent. [1] If this be to the aid and comfort of the theory of man's evolution, so be it.

General conclusion : the sources of information for the theologian touching on the question of the evolution of man urgently call upon the theologian to be cautious and at the same time to have an open mind. Caution is dictated because the question involves the proper interpretation of the sacred word of God which is not to be tied to whims and unfounded opinions, and because the problem affects dogmatic truths such as Original Justice, Original Sin and Redemption. The sources dictate an open mind, too, because the theologian in his search for truth cannot without harm to his own work disdain the help of genuine science.

If scientific research gives solid reason for modifying somewhat the picture of Adam such as Tradition has handed down, and to which we are accustomed in our thinking, let us heed the voice of the Holy Father and not reject the new just because it is new. In such an event science will prove to be the true handmaid of theology helping the queen of the sciences to understand better its own sources.

ALBERT L. SCHLITZER, C.S.C.

1. See the interesting suggestion of RAÏSSA MARITAIN in her *Histoire d'Abraham*, II, *L'état adamique*, Paris Desclée, 1947. She proposes that a considerable degree of mental perfection was left latent in Adam to be brought into actuality through succeeding generations. The Dominican, PÈRE M. LABOURDETTE expresses some sympathy with this view in his article : *Le Péché originel et les origines de l'homme*, in the *Revue Thomiste*, 1952, pp.5ff.

The anthropologist, WILHEM KOPPERS, will not yield to this view. In his recent work, *Primitive Man and his World Picture*, Sheed and Ward, N.Y., 1952, he argues in defence of the traditional view of the Golden Age of man in Adam.

A Note on the Kierkegaardian Either/Or

There is perhaps nothing in the writings of Kierkegaard which recurs with such telling frequency as the little phrase " either/or." In a very real way it is a dominant note of his thought and when we understand its significance we gain insight into his anti-intellectualism, his judgment on aesthetics, and his weird and wonderful method of indirect communication. But, although it is a vein that can be mined with great profit, it will be meaningless to consider the either/or without some notion of what Kierkegaard's writings are about.

The surest way to discover the central concern of the Kierkegaardian literature is to ascertain what he meant by " existence." Once we see that it indicates a pre-eminently ethical orientation of thought, we will avoid heavy critiques of a metaphysics which was neither formulated nor dreamt of : the real distinction of essence and existence has relevance for later existentialism but it is somewhat peripheral to Kierkegaard. For him, " existence " has the most everyday meaning possible, it is the life one lives. Existential thought accordingly is that which has relation to action ; the problem then is one of practical philosophy and more specifically of ethics. Everything Kierkegaard had to say relates to the human act. Indeed he tried to devise a way of speaking of action that would issue in a movement of the will on the part of his readers.

Kierkegaardian existentialism is concerned with being, to be sure, but with moral being, being as one ought to be. When Kierkegaard says that existence is a striving, [1] something to be acquired, it is obvious that he is concerned with a modality, a " how ", [2] and not with being simply. So too he says that God does not exist, but is, [3] making use of the *negatio negationis* to indicate that God does not acquire the goodness which He is. Existence, in the sense of being as one ought to be, is distinguished from existence loosely so called ; the existing individual is a driver manning the twin steeds of time and eternity, but " he also drives and is a driver." [4] We do not find here the ambiguity of later existentialists who speak of existence preceding essence ; rather we are faced with but another expression for the fact that a man first is and then must become what he should be.

1. *Concluding Unscientific Postscript* (trans. David F. Swenson and Walter Lowrie, Princeton, 1944), p.84.
2. *Ibid.*, p.181.
3. *Ibid.*, p.296.
4. *Ibid.*, p.276.

Before Socrates comes into existence, he quite simply is not. Once he is, the being opposed to his prior non-being is absolute being, being *simpliciter* ; because of this opposition of potency and act, being is first said of that which is distinguished from potency. [1] This absolute being is the substantial being of Socrates and everything that follows from it with necessity, such as having reason and will ; everything superadded to it will be being in a certain respect, accidental. Socrates becomes obese, tanned, bald, and although he truly is these things they are only accidental being for they presuppose being *simpliciter*. The good, on the other hand, connotes the perfected which is desirable. It is only when Socrates has acquired his ultimate perfection as a man that we will call him good simply, although there is a type of goodness which follows on the fact that he is, for existence is a perfection. Thus there is a converse relation between being and goodness *simpliciter* and being and goodness *secundum quid*. [2] That whereby Socrates is absolutely makes him good only relatively, that whereby he is absolutely good is only accidental being.

When Kierkegaard speaks about existence, we should understand what he says in the light of that being *secundum quid* which makes a person good simply. Corroboration for this stand will be had throughout what follows.

Living at a time when Hegelianism was exerting a major influence in Denmark, Kierkegaard was apalled at the fervour with which men bent themselves to the contemplation of reality. At an early age he noted in his Journal [3] that he would seek the archimedean point around which he could array the whole of reality : he found that point in action as opposed to thought. " What I really lack is to be clear in my mind *what I am to do*, not what I am to know, except in so far as a certain understanding must precede every action. The thing is to understand myself . . . to find a truth which is true *for me*, to find the *idea for which I can live and die*." [4] This early distrust of speculative truth, when it is presented as sufficient to convert a man to what he should be, contained the seeds of his revolt against Hegel, for what constituted Kierkegaard's great interest was the knowledge which is ordered to action ; he sought a truth that would be practical and not just speculative. Existential truth is practical truth and it is always passionate because it is dependent upon appetite. Hence, when he had pored over Hegel for years, translating him

1. *Ia*, q.5, a.1, ad 1. See also *Q. D. de Veritate*, q.25, a.5.

2. " Sic ergo secundum primum esse, quod est substantiale, dicitur aliquid ens simpliciter et bonum secundum quid, idest inquantum est ens ; secundum vero ultimum actum, dicitur aliquid ens secundum quid, et bonum simpliciter " (*Ia*, q.5, a.1, ad 1).

3. *The Journals of Soren Kierkegaard* (trans. and ed. Alexander Dru, Oxford, 1951), n.4.

4. *Ibid.*, n.22.

into Danish the better to understand him, and gradually came to realize that Hegelianism purported to be the System and yet contained no ethics, Kierkegaard turned from speculation and spent the rest of his life in an attempt to become another Socrates who would show men what they did not know. His method was negative, satirical, immensely enjoyable in the reading : he intended, he said, to indicate what it meant to be a man as opposed to being a mere speculative philosopher.

This dissatisfaction with Hegel was certainly justifiable. In its attempt to see in the confusion of the logical universal the actuality and knowability of the universal *in causando*, Hegelianism claimed to have brought the perfection of God's knowledge within reach of man. Applied to history, this became the search for the necessity behind the apparent contingency. Revelation urges us to know God as well as love Him, and Hegel interpreted this as a mandate to search out the ways of providence in history. [1] To find infallible providence is to find necessity, Hegel thought, and he claimed that we would understand history as God does and see the reason for good and evil. What this meant for human action is all too clear in the following statement : " What irks and infuriates us is not what is, but the fact that it is not as it should be ; once we know that it is as it must be — that is to say, not arbitrary or contingent —, we also recognize that it should be as it is." [2]

It was the good sense of Kierkegaard to recognize that, whether offered as an apple or a system, such knowledge could not be had ; this pseudo-wisdom falls before the Wisdom which assures us that *incertae sunt providentiae nostrae* (IX, 14). Hegelianism might roam the heady heights of universal history and view benignly the course of the world, but it could not make it easy for the individual to act. There is no necessity governing the prudential decision which must be made with fear and trembling. Thus it was that Kierkegaard set himself the task of making things difficult. Others could attempt to make things easy in virtue of speculation ; our melancholy Dane lit another cigar and decided to point out that all this speculation had not alleviated the difficulty of action. [3]

Kierkegaard elaborated an " existential dialectic " describing the movement away from categories which impeded action and towards ethics and Christianity. The movement is from the non-existential to the existential. The tool with which he worked was the disjunction

1. G. W. F. HEGEL, *Leçons sur la Philosophie de l'Histoire* (trad. J. GIBELIN, Paris, Vrin, 1937), Vol.I, p.23.

2. *Écrits concernant la politique et la philosophie du droit*, édit. LASSON, p.5. English translation given in " The Nature of Man and His Historical Being," by CHARLES DE KONINCK, *Laval théologique et philosophique*, Vol.V, n.2, pp.274-5.

3. So KIERKEGAARD describes the beginning of his authorship : *Journals*, n.536 ; *Postscript*, pp.165-167.

" either/or. " In ethical activity alternatives are presented between which one must choose in a passionate and therefore existential way, a way which involves the whole man. It was because speculation and poetry do not recognize such alternatives and consequently lack existential pathos that Kierkegaard rejected them as not properly human activities.

In the *Concluding Unscientific Postscript*, which is the closest thing to a philosophical work he ever wrote, Kierkegaard addresses himself to the Hegelian pure thought and to the tenet that thought and being are one. He denies this principle on the ground that existence cannot be thought, and in understanding this we must keep in mind our foregoing precisions on the meaning of being for Kierkegaard. It is synonymous with being *secundum quid*, being as one ought to be ; Kierkegaard is saying that one does not become good by thinking. " How is it with the supposed identity of thought and being in connection with the kind of existence that belongs to particular human beings ? Am I the good because I think the good ? " " If the content of thought were reality, the most perfect possible anticipation of an action in thought before I had yet acted, would be the action. In that manner no action would ever take place and the intellectual would swallow the ethical." " When I think of something good that I intend to do, is this identical with having done it ? By no means." [1] But because it is on the plane of human action that Kierkegaard takes exception to Hegel, he is led to concede many things in the realm of the speculative as long as they are not applied to existence. Thus he is willing to grant the Hegelian denial of the opposition of contradiction.

It may not be true that something can be true in philosophy and false in theology, but Kierkegaard suggests that something can be true for thought which is not so for the existing individual. [2] He notes that there has been a bit of controversy concerning the denial of contradiction and offers the following solution :

> Hegel is utterly and absolutely right in asserting that viewed eternally, *sub specie aeterni*, in the language of abstraction, in pure thought and pure being, there is no either/or. How in the world could there be when abstract thought has taken away the contradiction, so that Hegel and the Hegelians ought rather to be asked to explain what they mean by the hocus-pocus of introducing contradiction, movement, transition, and so forth into the domain of logic. If the champions of an either/or invade the sphere of pure thought and there seek to defend their cause, they are quite without justification. [3]

By the same token, Hegel is wrong when he would forget the abstraction of his thought and plunge into existence there to deny

1. *Postscript*, pp.294, 302, 303
2. *Ibid.*, p.271.
3. *Ibid.*, p.270.

the *aut aut*.[1] The philosopher may think in a realm where there are no contradictions, but as an existing individual he must admit that he is faced constantly with either or's which cannot be mediated. One does not live *sub specie aeterni*. The ethical lays hold of a man and demands that he refrain from contemplation, especially of universal history.[2] History can only judge the external, that which has quantitative importance ; ethics, on the other hand, is the inward and seeks a qualitative difference. This distinction of the internal and external recurs again in Kierkegaard's discussion of aesthetics. For Hegel the outer is the inner and the inner the outer, as indeed it must be for the historian and the poet ; if we cannot infer from the effects of actions to their cause we can make no historical generalizations, view no drama with comprehension. This assumes great importance when Kierkegaard opposes art and ethics and insists that the two have nothing in common. Kierkegaard's case against aesthetics and speculation is that we tend to substitute them for ethics. He castigates a " poetic existence " and the confusion of the historical with the ethical judgment.[3]

By thought we lift ourselves above the conflict of existence, abstract from the contrariety implied in the either or ; however, one cannot exist in this speculative stratosphere, so it must be regarded as a temptation. The disinterested contemplation of universal history, granting for the moment its possibility, does not diminish the difficulty of my particular actions which are not mere functions of speculative comprehension. This is Kierkegaard's charge against speculation ; it is the same one he makes in the case of aesthetics.

It will be well first to note an ambiguity which exists in the Kierkegaardian writings with regard to aesthetics. Most of Kierkegaard's books were attributed to a bevy of pseudonymous authors for reasons which we will touch on later. He refers to these works as the aesthetic production although they discuss ethics and religion as well as the so called aesthetic sphere of existence. The term, aesthetic, as applied to all the pseudonymous works, refers to the mode of communication and not to the content. At present we are not concerned with Kierkegaard's method of communication, but with his critique of the aesthetic " sphere."

Kierkegaard presents this sphere in the first volume of *Either/Or* and in the banquet scene (*In vino veritas*) of *Stages on Life's Way*, but it is not feasible to trace the argument which is stated so indirectly in those pages. There we are faced with representatives of the aesthetic sphere and their views and observations are meant to convey to us their *Weltanschauung*. It is much more economical

1. *Ibid.*, p.271.
2. *Ibid.*, p.284.
3. *Ibid.*, p.309.

of space and time to seek the general characteristics of this sphere in other works, although we miss thereby some very enjoyable reading.

The etymology of the word " aesthetic " is not unimportant for the comprehension of what Kierkegaard is trying to say, for sensuality is based on touch and the aesthetic sphere is the sensual life, the world of Don Giovanni, the seducer. However, Kierkegaard does not intend to restrict this sphere to the grosser manifestations of sensuality ; he is in fact more interested in the sophisticated aesthete who would make the categories of poetry those of real life. Thus a certain confusion is engendered, for remarks about poetry are also a criticism of the " poetic life." It is due to the fact that artistic categories are not existential that aesthetics is likened to speculation, for " the aesthetic and intellectual principle is that no reality is thought or understood until its *esse* has been resolved into its *posse*." [1] Life has meaning for the aesthete only in so far as it provides him with the material for artistic experience and he is not rich enough or poor enough to distinguish poetry from reality. [2]

> What does being a poet mean? It means having one's own personal life, one's reality in quite different categories from those of one's own poetic work, it means being related to the ideal in imagination only, so that one's own personal life is more or less a satire on poetry and on oneself. [3]

Such a life, Kierkegaard contends, must end inevitably in despair, for reality is not poetic and the demands which existence makes on the individual are not aesthetic ones. Aesthetics abstracts from existence and thus it too escapes the either/or, for it is not concerned with whether what it is treating is real or not as long as it is possible. [4] Too, the criteria of poetry are those of speculative history : the quantitative predominates, the outward and the visible. [5]

Kierkegaard read and loved the Greeks, and it was quite natural for him to compare his thought with theirs. He takes explicit issue with Aristotle with regard to the effect of poetry. Kierkegaard claims that poetry does not reconcile one with but rather arouses one against existence, " for poetry is unjust to men by reason of its quantitative estimate, it has use only for the elect, but this is a poor sort of reconciliation." [6] He complains that the fear and pity aroused by tragedy draw the spectator out of himself in such a way that he identifies himself with the hero, whereas religion would counsel

1. *Ibid.*, p.288.

2. *Either/Or*, Vol.I (trans. David F. and Lilian M. Swenson), p.253.

3. *Journals*, n.861. On this point, W. B. Yeat's poem, " The Choice " is of interest. Cf. *Collected Poems* (MacMillan, New York, 1951), p.242.

4. *Postscript*, p.286.

5. *Ibid.*, p.348.

6. *Stages on Life's Way* (trans. Walter Lowrie, Princeton, 1945), p.414.

a fear that has reference to oneself. [1] And yet : " It is not wrong of the spectator to want to lose himself in poetry, this is a joy which has its reward, but the spectator must not mistake the theater for reality, nor himself for a spectator who is nothing else but a spectator at a comedy." [2] Poetry can make the good triumph emphatically in five acts, but in real life results are never so perceptible and satisfying. In poetry we see things not as they are but as they ought to be, in this Kierkegaard is in agreement with Aristotle ; but imagining them as they ought to be and making them as they ought to be are two different things.

The accusation against speculation and poetry is the same : they both abstract from the difficulty of existence in such a way that either/or no longer causes the anguish it does for the individual who would posit an action. And since becoming good entails choice between opposing things, the individual would do well to eschew philosophy and poetry so as not to be tempted away from the task which is his. Just as universal history is a theater where God is essentially the only spectator, [3] so the little theater of poetry is not to be confused with the satisfaction of the ethical requirement. To surmount the difficulties of life by abstracting oneself out of them is a fantastic solution ; the true answer lies in the direction of passionate and dedicated existence.

Kierkegaard's concessions to Hegelian speculation surprise one much more than his charges against it, and his dissatisfaction with poetry seems to be somewhat of a mock problem. Nevertheless there is a certain truth in what he says and, *divo Thoma adjuvante*, we can give a more succinct and intelligible expression of that truth.

Due to the fact that the intellect draws things to itself and receives them according to its own mode, things which in themselves are related as contraries are not contrary in the mind.

> There can be no contrariety in the intellective soul, for it receives according to the mode of its existence ; indeed those things which are received by it are without contrariety, because the notions of contraries are not contrary in the intellect, but the science of contraries is one. [4]

The science of medicine considers both health and sickness although these cannot coexist in the same man, for

the being of one contrary is excluded by the other, but the knowledge of one is not removed by knowledge of the other, but rather aided. So it

1. *Ibid.*, p.417.

2. *Ibid.*

3. *Postscript*, p.141.

4. " In anima autem intellectiva non potest esse aliqua contrarietas. Recipit enim secundum modum sui esse ; ea vero quae in ipsa recipiuntur, sunt absque contrarietate, quia etiam rationes contrariorum in intellectu non sunt contrariae, sed est una scientia contrariorum " (*Ia*, q.75, a.6).

is that the forms of opposites are not opposed in the mind. Indeed the substance or essence of privation is the same as that of its opposite, just as in the mind the notion of health and sickness are the same, for it is by the absence of health that sickness is known. [1]

The intellect can know nothing which will cause it displeasure, nothing is contrary to its contemplative enjoyment of the intelligible species it abstracts from things. Even error is incapable of causing distress to the mind for either it is thought to be true and the mind delights in it as in the truth, or it is known to be error, and this is but another instance of knowing the truth. [2] In a very real way we get above the contrariety found in things when we know their natures ; indeed the knowledge of one contrary is the means of knowing the other and the two achieve a certain unity for the mind. Sickness is the negation of health, evil the negation of good : even non-being gains existence in the mind insofar as it is opposed to being. This by no means destroys the opposition of contradiction, however, for we can never understand a thing as simultaneously and in the same respect both of two opposites. [3]

In the case of the will this situation is reversed, for the will's movement is towards things as they are in themselves. There may be no contrariety in the understanding of contraries, but as they exist they are opposed and this contrariety will be reflected in the will as it relates itself to things. It is a good for the intellect to know goodness, a good to know evil, [4] but this happy neutralism disappears when it becomes a question of choosing the one or the other. Then it is that the full impact of their contrariety strikes us.

. . . There is nothing in the same genus which is contrary to the delight we take in consideration, so that there would be some other consideration contrary to the first. The reason for this is that the species of contraries are not contraries in the intellect ; thus the delight had in considering white is not contrary to that had in considering black. But because the

1. " Esse autem unius contrarii tollitur per esse alterius ; sed cognitio unius oppositi non tollitur per cognitionem alterius, sed magis iuvatur. Unde formae oppositorum in anima non sunt oppositae. Quinimmo ' substantia ', idest quod quid erat esse privationis est eadem cum substantia oppositi, sicut eadem est ratio in anima sanitatis et infirmitatis. Per absentiam enim sanitatis cognoscitur infirmitas " (*In VII Metaph.*, lect.6, n.1405).

2. *Q. D. de Veritate*, q.26, a.3, ad 8.

3. " Dicendum quod ipsae res contrariae non habent contrarietatem in anima, quia unum est ratio cognoscendi alterum ; et tamen in intellectu est contrarietas affirmationis et negationis, quae sunt contrariae, ut dicitur in fine *Perih.* Quamvis enim esse et non esse non sint contraria, sed contradictorie opposita, si considerentur ipsa significata prout sunt in rebus, quia alterum est ens, et alterum est pure non ens ; tamen si referantur ad actum animae, utrumque ponit aliquid esse. Unde esse et non esse sunt contradictoria ; sed opinio qua opinamur quod bonum est bonum, est contraria opinioni qua opinamur quod bonum non est bonum" (*Ia IIae*, q.64, a.3, ad 3). See Aristotle, *On Interpretation*, chap.14.

4. *Q. D. de Veritate*, q.26, a.3, ad 6.

act of the will consists in a movement of the soul toward the thing and things in themselves are contraries, movements of the will toward contraries are themselves contrary, e.g. the desire of sweet is contrary to desire of the bitter. [1]

It is a perfection to know those things which it would be an imperfection to desire ; the will does not abstract from things as does the intellect and those things chosen are conjoined to the soul and if they are imperfect they leave their mark on it. [2] Intellectually it is a delight to know evil both with regard to the subject and the object, for as known the object is attained in its intelligibility. But insofar as this object is opposed to the will, there is a certain distress following on the comprehension : it is to be remembered that the intellect is but a part of the subject. [3] The act of intellection, seen only as that which is proper to a given potency, does not admit of contrariety in the same genus ; but with regard to operation, when it is a question of union with the thing, contrariety asserts itself. [4] Appetite comes to play a role in the way that a man looks on the proper object of his intellect ; so much so that one can be said to hate the truth. This can only be said with respect to some particular truth, however, insofar as it conflicts with an object of desire. For example, one may wish to be free of the truth of Faith so that he might freely sin. [5] The contrariety involved is, again, not in the intellect but in the whole man.

All of this is repeated when we turn to art ; the contrariety of things is surmounted in such a way that chance and contingency are *quodammodo* comprehended. The poet can represent for us that which in the harsh reality of our personal lives would cause pain and anguish and we experience great pleasure in the imitation.

And it is also natural for all to delight in works of imitation. The truth of this second point is shown by experience : though the objects themselves be painful to see, we delight to view the most realistic representations of them in art, the forms for example of the lowest animals and of dead bodies. [6]

1. " . . . Delectatio quae est in considerando non habet contrarium in eodem genere, ut scilicet aliqua alia consideratio sit ei contraria ; et hoc ideo quia species contrariorum in intellectu non sunt contrariae ; unde delectationi quae est in considerando album non contrariatur delectatio quae est in considerando nigrum. Sed quia actus voluntatis consistit in motu animae ad rem, sicut res in seipsis sunt contrariae, ita motus voluntatis in contraria sunt contrarii : desiderium enim dulcis contrariatur desiderio amari . . . " (*Q. D. de Caritate*, q.6, ad 8).

2. *Ia IIae*, q.86, a.1, ad 2.

3. *III Sent.*, d.15, q.2, a.3, sol.3, ad 3.

4. *Ibid.*, d.26, q.1, a.5, ad 5.

5. *Ia IIae*, q.29, a.5.

6. *Poetics*, 1448 b 9 ; cf. *Ia IIae*, q.32, a.8.

The workings of chance in the compass of a play are a delight to see because we can understand their meaning ; the good artist can make the most improbable encounter seem inevitable and his plot imposes rationality on the irrational. One leaves the theater reconciled with life, content that there is a meaning in the unpredictable quirks of daily existence. A well-worked tragedy evokes the emotions of fear and pity in the spectators, arouses an inner tumult which is only resolved at the end of the piece ; the playwright is master of the little world where evil is punished and the good quite palpably rewarded.

Kierkegaard's statements on all this strike one as a laboring of the obvious : poetry is not life, life is not poetic. The imitation of human actions takes what Kierkegaard calls somewhere a foreshortened perspective thanks to which there is a beginning, middle and end. Problems raised find their solution and there is a stabilization of the emotions aroused by the conflict. In life it is otherwise : as existing individuals we are *in via* and the drama of our lives goes on after the theatrical curtain is rung down. The part we play is known fully only to God. Art bestows a certain finality on events and surmounts the banality and uncompleteness of existence. More, it portrays the inner conflict of the individual in an outward perceivable way ; it arouses a given emotion by finding what Eliot calls an " objective correlative " which assimilates the subjective. Now this is precisely Kierkegaard's complaint. Not only does art present the choice between an either/or as inevitable but it would have us believe that external manifestations are an infallible index to what is contained within.

Kierkegaard wants to oppose art and morality, aesthetics and the ethical demands which are made on the existing individual. This issues in a rather strange stand on the relationship of art and morals. In an entry in the *Journals*, [1] he says that it is nonsense to demand that the poet unfold a moral view of life in his works ; this is but the desire of mediocrity that all attempts at greatness be brought low so that one who is mediocre can feel justified in never having dared anything out of the ordinary.

> Those who really have a moral attitude are perfectly able to endure that appearance in reality, and do not quarrel with the poet for depicting the enormous success of immorality, how it achieves greatness and power —he sees through all that and sees immorality and that is enough for him.

This opinion will seem the more surprising in a moment when we consider Kierkegaard's theory of indirect communication, but it cannot be dismissed as an isolated remark. In the *Stages* he refers to Hamlet's doubts as " unpoetic scruples."

1. N.857.

If Hamlet is kept in purely aesthetic categories, one must see to it that he has demoniac strength to carry out such a resolution. His scruples are in this case of no interest at all ; his procrastination and delay . . . merely abase him so that he does not become an aesthetic hero, and so becomes nothing at all. [1]

Kierkegaard persists in seeing poetry and the aesthetic sphere of existence as amoral ; in imitating human actions poetry is bound by no restriction whatsoever. That it might at least be as restricted as the men it imitates never seemed to occur to him, but surely if the artist ignores the principles of synderesis and the generalities of moral science his imitation will be vitiated at its root and turn into a distortion.

Be this as it may, we can agree with the general argument under discussion. Art and science surmount the contrariety with which action is everywhere faced ; they move in a realm in which contrariety does not present the difficulty it does on the existential or prudential level. So much is true, but Kierkegaard seems to have been overwhelmed by certain pretentious philosophers and artists when he calls these two essential temptations. The philosopher who thinks that his ability to define virtue makes him virtuous had best remember that he can also define vice. Hegel subsumed the ethical task into speculation, just as some artists, noting that in their art they got above the harsh opposition of good and evil, sought salvation in this aesthetic abstraction. [2] Could they not depict men of high virtue as well as draw villains of the meanest stripe? Let the *vulgus* be concerned with the banal contrariety of things, on Olympus good and evil sip from the same cup. These aberrations should be seen for what they are, and not as the final word on speculation and art. Kierkegaard is right in maintaining that it is in the existential order that either/or has its real meaning, for action implies will and the will moves toward things as they are in themselves. The will does not act as a part of man, but he is identified with its acts : *Facti sunt abominabiles, sicut ea quae dilexerunt* (Osee, ix, 10).

These observations also explain the genesis of Kierkegaard's theory of indirect communication as evidenced in the pseudonymous works. His purpose was a polemical one, for he wanted to lead

1. *Stages*, p.410.

2. " *Ernest.* Must we go, then, to Art for everything? *Gilbert.* For everything. Because Art does not hurt us. The tears that we shed at a play are a type of the exquisite sterile emotions that it is the function of Art to awaken. We weep, but we are not wounded. We grieve, but our grief is not bitter. [. . .] It is through Art, and through Art only, that we can realize our perfection ; through Art, and through Art only, that we can shield ourselves from the sordid perils of actual existence " (Oscar Wilde, *Intentions*, Methuen & Co. Ltd., London, pp.167-8). For a dissimilar but relevant treatment of this deification of art, see Reid MacCallum, *Imitation and Design* (ed. Wm. Blissett, University of Toronto Press, 1953), pp.46-53. Cf. also Schopenhauer, *The World as Will and Idea*, Vol. II, Bk.3.

men into existential categories. He judged that they already had more than enough to think about : he would *make* them choose. But to communicate an existential message directly would enable men to think about it and the contrariety he wanted to stress, the either/or which became his hallmark, would be deadened by thought which would surmount the disjunction. What was required was a mode of communication which would be indirect and so insinuate his message into the hearts of men that it would appear as a good to be chosen rather than a truth to be known. This artistic method explains the wider conception of aesthetics by which Kierkegaard qualified his pseudonymous writings.

The existential dialectic presented in these works was Kierkegaard's own poetic production, but it was poetic in method only, not in intent. He had no desire to reconcile men with existence : his task was to force them to realize what it means to be a man. He conceived of a truncated poetry which would present men grappling with existential problems, the practical problems of life ; all the alternatives of action would be given and then, stop. No solution was to be found in these " passion narratives " thus leaving the problem grating like an unresolved chord in the soul of the reader ; this lack of a solution, Kierkegaard reasoned, would force him to enter into the problem, not as a disembodied intellect, but as a man whose passional nature had been aroused. Thus his method shared something with poetry : " a passion narrative also stands in relation to a reader just as the aesthetic production does." [1] This method was evident in his first work, *Either/Or*, which pits an aesthete against a representative of the ethical sphere in such a way that neither view is said to win the day. Hence the title. The method varies in the later books, but it always retains its original purpose : to draw the reader into the discussion so that problems raised would not be something to think about, but the clarion call to action.

There is then a fundamental inconsistency in Kierkegaard with regard to art : he rejects it with one hand and takes it back with the other. He denies that art serves a moral purpose and then makes use of art to draw men to Christianity. In the rejection, he says that art is beyond good and evil in every way ; he then turns it to what he conceives is good purpose. We merely touch on this anomaly here as a full treatment would doubtless require an extended exposition of the doctrine on art and morality. We can note that Kierkegaard's inborn extremism led him to predicate absolute freedom from morals of art because he recognized it eluded the existential pathos before contraries, just as the realization that speculation also achieved this led him to concede that the principle of contradiction was thereby abrogated.

1. *Stages*, p.416.

The further question of the efficaciousness of the Kierkegaardian method is a difficult one to answer. The poetic disposes for virtue, but it is a feeble vehicle for doctrine, it is in fact *infima doctrina*. Yet Kierkegaard endeavoured to present the most speculative problems in an artistic manner, even those of faith ; moreover he contended that this was the only method possible. This penchant of his has had its effect on the later schools of Existentialism in that they deny any distinction between art and philosophy, the novel and the treatise. [1] However, one will willingly admit that when it is a question of moving the will of another, art is the most effective tool at our command.

These elementary considerations serve to show the importance of the notion of either/or in the thought of Kierkegaard, and although, due to the brevity of our treatment, we cannot invoke the maxim " tout comprendre est tout pardonner," we can see the great amount of truth which underlies the Kierkegaardian position in this one area. It is unfortunate that his overpowering desire for black/white tends to diminish the effectiveness of his either/or ; however, it will be agreed that this did not stamp out every similarity with orthodoxy.

RALPH MCINERNY.

1. Something stated quite explicitly by ALBERT CAMUS, *Le Mythe de Sisyphe* (Paris, Gallimard, 1942), pp.133-138.

Orthodoxy in *Paradise Lost*

Many critics rate *Paradise Lost* the greatest single poem in the English language. Chaucer, in his series of tales, presents with unmatched realism, humor, and warmth a delightful galaxy of human beings. Shakespeare, in the whole range of his plays, not only peoples his stage with an astonishing variety of persons but at the same time delves deeply into the problems and conflicts of the human heart. Yet in this single, unified epic poem of sustained high seriousness, Milton, like his Italian predecessor Dante, deals with the major question of every man — his relation to God and to the enemy of his soul. To his subject matter Milton himself attributed the excellence by which he would soar above Homer and Vergil, [1] and he humbly invoked the aid of the Holy Spirit to write fitly this " advent'rous song " :

> What in me is dark
> Illumine, what is low raise and support ;
> That to the height of this great Argument
> I may assert Eternal Providence,
> And justify the ways of God to men. (I.22)

It is, however, through its superior artistic merit that *Paradise Lost* has achieved a place in world literature high above other works dealing with much the same subject matter, Vondel's *Lucifer*, for example, or Du Bartas' *La Semaine*.

The more highly *Paradise Lost* is regarded as a work of art, the more pressing becomes the question it poses for the intelligent general reader, especially one of Catholic background : Can he thoroughly enjoy this poem for its æsthetic excellence and at the same time cherish it for its truth, or will he feel impelled to turn in disappointment from one of the finest works of his literary inheritance because he rejects too much of its content? To determine the answer, two main questions will occupy this study of *Paradise Lost* : How acceptable from the dogmatic, moral, and philosophical points of view is its treatment of the material drawn from Scripture? What values does the author contribute by his poetic method?

I

Milton fuses classical, medieval, Renaissance, and Biblical material to create a poem that assimilates literary and religious tradition and at the same time electrifies it with powerful poetic conceptions and subtly varied and melodious blank verse. Familiar accounts of

1. See *PL* I.13-15 ; IX.13-19, 31, 40.

Scripture come to new life by his poetic method. Consider his elaboration of two Biblical texts.

The first is " For all the gods of the Gentiles are devils " (*Ps.* 95:6). While imitating Homer's sonorous catalogue of the Greek ships at Troy, Milton gives to the demons assembling at Satan's call the names of pagan gods. [1]

> And Devils to adore for Deities :
> Then were they known to men by various Names,
> And various Idols through the Heathen World. (I.373)

Among them are Moloch and Belial, unforgettably characterized in the Great Consult where the one urges violent resistance and the other timorous submission — sharply opposed policies that not only owe something to Milton's acquaintance with the crucial parliamentary debates of his time but also gain voice in many another political crisis.

The second text is from the Epistle of Saint James (1:15) : " For when passion has conceived, it brings forth sin ; but when sin has matured, it begets death." From this text Milton develops his superb allegory of Sin and Death, [2] which far surpasses in both moral significance and poetic power anything to be found in medieval or Spenserian allegory.

Having cleverly won in the Great Consult the coveted mission to go alone to Earth to seduce man (II.426-466), Satan finds his exit from Hell barred by two formidable shapes guarding the gates. The first is Sin.

> The one seem'd Woman to the waist, and fair,
> But ended foul in many a scaly fold
> Voluminous and vast, a Serpent arm'd
> With mortal sting : about her middle round
> A cry of Hell Hounds never ceasing bark'd
> With wide Cerberean mouths full loud, and rung
> A hideous Peal : yet, when they list, would creep,
> If aught disturb'd their noise, into her womb,
> And kennel there, yet there still bark'd and howl'd
> Within unseen. (II.650)

The other is Death, described in inchoate images that remind us, as we read in the *Imitation of Christ* (II.23), that Death comes in many shapes.

> The other shape,
> If shape it might be call'd that shape had none
> Distinguishable in member, joint, or limb,
> Or substance might be call'd that shadow seem'd,
> For each seem'd either. (666)

1. Cf. Burton, *Anatomy of Melancholy*, I.ii.1,2.

2. Gower, *Mirrour de l'Omme* (205-237), had represented Sin as Satan's daughter who by him conceives the Seven Deadly Sins.

Just when Satan and this shapeless monster are poised for angry instant combat, the " Snaky Sorceress " rushes between :

> O Father, what intends thy hand, she cri'd,
> Against thy only Son? What fury O Son,
> Possesses thee to bend that mortal Dart
> Against thy Father's head? (727)

Amazed, Satan asks her why, on this their first meeting, she calls him father and calls this monster his son, for, he says,

> I know thee not, nor ever saw till now
> Sight more detestable than him and thee. (744)

She replies with words, all too true, that may be put to every sinner :

> Hast thou forgot me then, and do I seem
> Now in thine eye so foul, once deemed so fair . . . ?
> (747)

Then she tells of her origin in Heaven [1] (and here Milton with astonishing aptness adapts the Greek myth that Athena sprang full-panoplied from the brow of Zeus) :

> . . . in sight
> Of all the Seraphim with thee combin'd
> In bold conspiracy against Heav'n's King,
> All on a sudden miserable pain
> Surpris'd thee, dim thine eyes, and dizzy swum
> In darkness, while thy head flames thick and fast
> Threw forth, till on the left side op'ning wide,
> Likest to thee in shape and count'nance bright,
> Out of thy head I sprung. (749)

She fell with Satan and, sitting stationed at Hell's gate, found herself pregnant by him and there brought forth Death, their son. The incestuous and proliferating [2] nature of sin and death she explained further in hideous but allegorically true detail :

> I fled, but he pursu'd (though more, it seems,
> Inflam'd with lust than rage) and swifter far,
> Me overtook his mother all dismay'd,
> And in embraces forcible and foul
> Ingend'ring with me, of that rape begot
> These yelling Monsters that with ceaseless cry
> Surround me, as thou saw'st, hourly conceiv'd
> And hourly born, . . .
> Before mine eyes in opposition sits

1. The precise moment is told in V.668. Cf. MATT. 5:28.
2. Cf. *Macbeth*, III.iv.136 ; also *The Faerie Queene*, I.i.15.

Grim Death my Son and foe, who sets them on,
And me his Parent would full soon devour
For want of other prey, but that he knows
His end with mine involv'd. (790-807)

Quickly recognizing their relationship and interdependent interests, Satan informs them of his plan :

Dear Daughter, since thou claim'st me for thy Sire,
And my fair Son here show'st me, the dear pledge
Of dalliance had with thee in Heav'n, and joys
Then sweet, now sad to mention, through dire change
Befall'n us unforeseen, unthought of, know
I come no enemy, but to set free
From out this dark and dismal house of pain,
Both him and thee, . . . I . . . shall soon return,
And bring ye to the place where Thou and Death
Shall dwell at ease, . . .
there ye shall be fed and fill'd
Immeasurably, all things shall be your prey.
(817-844)

Thereupon Sin, characteristically disobedient to her charge, unlocks the gates of Hell and Satan passes through them on his journey to Earth.

One may discern a certain parallel between the internal relations of the evil three and those of the Holy Three of the Trinity, whom they wickedly oppose, in that Sin was begotten of Satan alone while Death proceeded from both Satan and Sin.

By a kind of sinister telepathy, Sin, sitting at Hell's gates, instantly senses the success of Satan's mission and addresses Death :

O Son, why sit we here each other viewing
Idly, while Satan our great Author thrives
In other Worlds, and happier Seat provides
For us his offspring dear? . . .
Methinks I feel new strength within me rise,
Wings growing, and Dominion giv'n me large
Beyond this Deep ; . . . Thou my Shade
Inseparable must with me along
For Death from Sin no Power can separate.
. . . let us try
Advent'rous work, yet to thy power and mine
Not unagreeable, to found a path
Over this Main from Hell to that new World
Where Satan now prevails, a Monument
Of merit high to all th' infernal Host
Easing their passage hence, for intercourse,
Or transmigration, as their lot shall lead.

> Nor can I miss the way, so strongly drawn
> By this new felt attraction and instinct.
> (X.235-263)

Filled with new energy, these two build a bridge joining Earth to Hell. They meet Satan returning triumphant after seducing Eve, and Sin exultantly stresses their intrinsic relationship.

> O Parent, these are thy magnific deeds,
> Thy Trophies, which thou view'st as not thine own,
> Thou art their Author and prime Architect :
> For I no sooner in my Heart divin'd,
> My Heart, which by a secret harmony
> Still moves with thine, join'd in connexion sweet,
> That thou on Earth hadst prosper'd, which thy looks
> Now also evidence, but straight I felt
> Though distant from thee Worlds between, yet felt
> That I must after thee with this thy Son ;
> Such fatal consequence unites us three :
> Hell could no longer hold us in her bounds,
> Nor this unvoyageable Gulf obscure
> Detain from following thy illustrious track.
> Thou hast achiev'd our liberty, confin'd
> Within Hell Gates till now, thou us impow'r'd
> To fortify thus far, and overlay
> With this portentous Bridge the dark abyss.
> Thine now is all this World, thy virtue hath won
> What thy hands builded not, thy Wisdom gain'd
> With odds what War hath lost, and fully aveng'd
> Our foil in Heav'n ; here thou shalt Monarch reign.
> (354)

Satan highly commends their efforts that have made

> Hell and this World, one Realm, one Continent
> Of easy thorough-fare. (392)

This easy future traffic, in striking contrast to Satan's hazardous and difficult journey through Chaos (II.890-1055), measures too truly his dire success (cf. I.1024). He bids them go on to Paradise.

> There dwell and Reign in bliss, thence on the Earth
> Dominion exercise and in the Air,
> Chiefly on Man, sole Lord of all declar'd,
> Him first make sure your thrall, and lastly kill.
> My Substitutes I send ye, and Create
> Plenipotent on Earth, of matchless might
> Issuing from me : on your joint vigor now
> My hold of this new Kingdom all depends,
> Through Sin to Death expos'd by my exploit. (399)

Thus were Sin and Death let loose upon the world.

> So saying he dismiss'd them, they with speed
> Their course through thickest Constellations held
> Spreading their bane ; the blasted Stars lookt wan,
> And Planets, Planet-strook, real Eclipse
> Then suffer'd. (409)

On his return to Hell Satan sardonically boasts to his followers of what he and his progeny have wrought against man :

> Him by fraud I have seduc'd
> From his Creator, and the more to increase
> Your wonder, with an Apple ; he thereat
> Offended, worth your laughter, hath giv'n up
> Both his belov'd Man and all his World
> To Sin and Death a prey, and so to us,
> Without our hazard, labor, or alarm,
> To range in, and to dwell, and over Man
> To rule, as over all he should have rul'd. (485)

Who can read this potent allegory and not be moved by its hideous and menacing truth, by the contrast between what sin appears to be when it is chosen preferably to God and what it really is? A triumph of poetic synthesis, this allegory is a fitting and not exaggerated development of the text from Saint James. Its intense ugliness, proper to evil and made palpable by powerful imaginative conceptions, impresses upon every sinner its ominous relevance to himself. It stamps Milton a master of artistic method. Had he written nothing but this, he would deserve a high place among poets of religious truth.

II

Since the greater part of its subject matter is derived from Holy Scripture, *Paradise Lost* is predominantly theological. To what extent can a Catholic accept its theology?

That Milton was anti-Catholic his prose tracts clearly testify. That he remained so is evident from *Paradise Lost*, XII.512-535, and from his last tract, " Of True Religion, Heresy, Schism, Toleration, and What Best Means May Be Used against the Growth of Popery," published in 1673, the year before his death. In the latter he asserted, " popery is the only or the greatest heresy " and he excluded it from the toleration he urged toward other sects, because, he wrote, " popery, as being idolatrous, is not to be tolerated either in public or in private ; it must be now thought how to remove it, and hinder the growth thereof, I mean in our natives, and not foreigners, privileged by the law of nations."

The unpublished manuscript of Milton's *De Doctrina Christiana*, discovered in 1823, was translated and edited by Bishop Charles Sumner and published in 1825. In it Milton affirms that the Holy Scriptures, privately interpreted, constitute the sole rule of faith ; that the Father alone is the one supreme self-existent infinite God ; that before the world was made, but not from eternity, the Father created or produced or generated the Son, not of necessity, but by a decree of His free will, imparting to the Son as much as He pleased of the divine nature and substance, as in the fullness of time He miraculously begot Him in His human nature of the Virgin Mary ; that the Son is emphatically not coessential, coequal, or coeternal with the Father ; that He does not possess absolute omnipresence, omniscience, or omnipotence ; that His nature is divine, but distinct from and clearly inferior to the nature of the Father ; that He sits at the Father's right hand, next in dignity ; that the Holy Spirit was freely created or produced of the substance of God, probably before the foundation of the world, but later than the Son and that He is far inferior to Him ; that the Father, through His Word and Spirit, created all things not out of nothing but from matter which proceeded from God, incorruptible, and at first confused and formless, as an efflux of the Deity.

Is the theology of *Paradise Lost* in accord with these heresies of *De Doctrina*? If not, why not?

Some scholars have offered cogent arguments for dating the composition of *De Doctrina Christiana* 1642-1649, whereas others date it 1655-1660. *Paradise Lost* was first published in 1667. During the years between, Milton may have changed his views. Or he may have put into the poem theological views that he did not personally accept, just as he incorporated in it the Ptolemaic astronomy, perhaps for literary reasons or on account of its more general familiarity to his readers, although he himself undoubtedly accepted the system of Copernicus, Kepler, and Galileo.

Whatever be the reasons, this study will endeavor to show that *Paradise Lost* is capable of being read as a poem embodying theological doctrines in conformity with those of the Catholic Church.

Numerous passages in *Paradise Lost* cannot easily be reconciled with *De Doctrina*.

The Arian or anti-Trinitarian view of the inferiority of Christ and the Holy Spirit to the Father, while clearly set forth in the treatise, is less distinct and obvious in the poem (which did not disturb generations of orthodox readers), but no doctrinal passage in the poem is inconsistent with the Arianism of Milton's formal theology. [1]

1. Douglas Bush, *English Literature in the Early Seventeenth Century* (Oxford, 1945, reprinted 1948). The remark in parenthesis corroborates the view that the theology of the poem itself is ordinarily understood by Christian readers as orthodox.

Milton has, however, deliberately avoided in his poem, especially in the more dangerous issues, the clear and uncompromising precision of his statements in prose. [1]

In the opinion of this writer, these critics express the disagreement too mildly.

The intelligent general reader commonly reads poetry for what it means to him rather than for precisely what the author meant by it. The literary specialist, on the other hand, seeks to determine as carefully as possible what the author intended, often with dubious results, challenged by other literary specialists. For the latter it is legitimate and desirable to consider fully whatever light may be shed on *Paradise Lost* by *De Doctrina* or any other relevant work, but that is not the purpose of this study, which is concerned rather with what the intelligent general reader with a Catholic mind will normally understand.

Milton himself suggests the point of view adopted here. Discussing *Ecclesiastes* 12:7, he writes : " Euripides in the *Suppliants* [line 519] has, without being aware of it, given a far better interpretation of this passage than the commentators in question." [2] Here Milton is not attributing to Euripides any awareness of the Scripture (quite the contrary) nor to the Biblical writer any awareness of Euripides. Milton is simply saying that he himself as a reader finds a passage in Holy Scripture illuminated by a passage in Euripides, that the one is in conformity with the other. In the same spirit, a Catholic may read *Paradise Lost* and, without wrenching the text, find it in conformity with his faith, find it illuminated by Holy Scripture or interpreted by Saint Augustine or Saint Thomas. In this spirit a Catholic can enjoy to the full this great work of his literary heritage and at the same time experience the power poetry has to make truth delight and move the soul.

A mere partial list of orthodox views in *Paradise Lost* is not unimpressive. The poem shows us the one and only living God, eternal infinite Spirit, incomprehensible, uncreated ; Creator of all that is ; immense, immutable, yet free ; omnipresent, omniscient, omnipotent ; gracious and merciful, true, and magnificently just. God's immutable decrees are Fate ; chance is but His permissive Will. He is the source, the fountain, and exemplar of all goodness. To Him, angels, demons, men, and all nature owe being. Man, whom He made in His own image, is of unique value and dignity ; to him God gave free will,

1. James Holly Hanford, *A Milton Handbook*, 4th ed. (New York, 1946), p.122.

2. *De Doctrina Christiana*, I.xiii. In his remarks on tragedy prefacing *Samson Agonistes*, Milton writes : " The Apostle Paul himself thought it not unworthy to insert a verse of Euripides into the text of Holy Scripture, *I Cor.* 15.33." In this study, we shall from time to time emulate Milton's practice of glancing at comparable passages related only in the reader's mind to the passage under consideration.

His own wonderful and precious attribute. Milton is not only orthodox but eloquent in teaching the primal goodness of man and nature, of reason and passion ; the need of self-discipline and temperance as opposed to excess ; the internality of goodness ; the origin, nature, and heinousness of sin ; the necessity and sufficiency of grace ; the compatibility of obedience with free will ; original sin inherited from Adam ; regeneration through repentance, self-condemnation, and the mediation of Christ, who made satisfaction for all men of all times, both before and after His coming ; the necessity of faith *and* works ; the brotherhood of men ; the ideals of wedded love ; the proper subordination of woman to man in the family ; the resurrection of the dead, the punishment of the wicked, and the reward of the just.

We know that Milton was familiar with Aristotle's concept of God as *Actus Purus*, for he comments adversely on it.

> There seems, therefore, an impropriety in the term of *actus purus*, which Aristotle applies to God, for thus the Deity would have no choice of act, but what he did he would do of necessity and could do in no other way, which would be inconsistent with his omnipotence and free agency. It must be remembered, however, that the power of God is not exerted in things which imply a contradiction. [1]

Whether or not Milton was acquainted with the application of this concept of *Actus Purus* to the theology of the Trinity, we do not know with certainty. We are certain that he was familiar with Saint Augustine's *De Civitate Dei*, for he listed it in his *Commonplace Book*. In this work Saint Augustine touches on *Actus Purus* and deals with it more fully in *De Trinitate*, which Milton may have known, although it is not listed in the *Commonplace Book*, for it can hardly be assumed that the *Commonplace Book* presents an exhaustive list of Milton's studies. Saint Thomas, who is not listed, develops *Actus Purus* most fully. The doctrine may be briefly summarized.

Pure Act expresses the absolute perfection of God, for, if there were in God any passive potentiality, its actuability would render Him mutable. The activity of His internal nature must be in act by the very necessity of His Being. This necessary internal activity is the eternal intercourse of the Trinity Himself, for God is Being, Knowledge, and Love, and these Three are One. The one perfect Being (the Father) perfectly comprehends Himself because His power " in knowing is as great as His actuality in existing." [2] This Knowledge of Himself (His Word, His Son) must therefore be coequal and coeternal with Himself, because God would not be All Perfect if His

1. *Ibid.*, I.ii.

2. Saint Thomas, *Summa Theologiae*, I, q.14, a.3, literally translated by Fathers of the English Dominican Province. All quotations from Saint Thomas in this study are from this work (New York, 1947).

Knowledge of Himself were less than Himself or if He had ever not thus fully known Himself.

> The procession of the Word in God is generation . . . by way of similitude, inasmuch as the concept of the intellect is a likeness of the object conceived : — and exists in the same nature, because in God the act of understanding and His existence are the same [1] . . . The act of God's intellect is His substance. [2]

The Father eternally generates the Son. Hence He says, " This day have I begotten Thee." [3] This day means every day, every instant, continuously. The Father, beholding Himself thus mirrored in His Word, loves Himself (the Son) and the Word loves the Father from whom He eternally proceeds — whence originates the second procession — the Holy Spirit, who is the Love between the Father and the Son, proceeding from both equally, and equal to each, coeternal with each, since, God being Pure Act, there was never a time when the Father and the Word did not love each other, and love each all the other. This second procession is not called generation, because it is the term of God's will, whereas it is the unique characteristic of intellect that it generates its likeness.

Whether or not Milton changed his mind about the nature of God by the time he wrote his great poem, if one were to assume that he did ardently subscribe to this doctrine, it would be difficult to conceive how he could have expressed it better than he actually does again and again in *Paradise Lost.*

First the equality of the Son with the Father is emphatically stated. [4] (The italics are mine.)

> So spake the Father, and unfolding bright
> Toward the right hand his Glory, *on the Son*
> *Blaz'd forth unclouded Deity* ; he *full*
> Resplendent *all* his Father manifest
> Express'd. (X.63)

> He said, and on his Son with Rays direct
> Shone *full*, he *all* his Father *full* exprest
> Ineffably into his face receiv'd,
> And thus the *filial Godhead* answering spake.
> (VI.719)

> Beyond compare the son of God was seen
> Most glorious, in him *all* his Father shone
> *Substantially* express'd. (III.138)

1. *Ibid.*, I, q.27, a.2.
2. *Ibid.*, I, q.14, a.4.
3. *Ps.* 2:7. Cf. *PL.* V.603.
4. In emphasis on fullness, cf. *Col.* 1:19.

. . . the Son of God
In whom the *fullness* dwells of love divine, . . .
(III.224)

Begotten Son, *Divine Similitude,*
In whose conspicuous count'nance, without cloud
Made visible, th' Almighty Father *shines,* . . .
(III.384)

Girt with *Omnipotence,* with Radiance crown'd
Of Majesty Divine, Sapience and Love
Immense, and *all* his Father in him *shone.*
(VII.194)

The *Filial Power* arriv'd, and sat him down
With his great *Father,* for he *also* went
Invisible, yet stay'd (such privilege
Hath *Omnipresence*). (VII.587)

The Father expresses the nature of their relation when He addresses His Son :

Son who art *alone*
My Word, my wisdom and effectual might,
All hast thou spok'n as my thoughts are, all
As my Eternal purpose hath decreed : (III.170)

Nor shalt thou by descending to assume
Man's Nature, less'n or degrade thine own.
Because thou hast, though Thron'd in highest bliss
Equal to God, and *equally* enjoying
God-like fruition, quitted all to save
A World from utter loss, . . .
Here shalt thou sit incarnate, here shalt Reign
Both *God* and Man, . . . *all* Power
I give thee, . . . (III.303-318)

Son, thou in whom my glory I behold
In *full* resplendence, Heir of *all* my might,
Nearly it now concerns us to be sure
Of *our Omnipotence.* (V.719)

The Father testifies to this equality when He declares :

All power on him transferr'd : . . .
Effulgence of my Glory, Son belov'd,
Son in whose face invisible is beheld
Visibly, *what by Deity I am*
And in whose hand *what* by Decree I do, . . .
(VI.678-683)

To the angels the Father gave command,

> Adore the Son, and *honour him as me.* (III.343)

Clearly understanding that the Son is presented as equal to the Father, Lucifer disdains

> Knee tribute yet unpaid, prostration vile,
> Too much to one, but *double* how endur'd,
> To one and to *his image* now proclaim'd ?
> (V.782)

Addressing the Father, the Son calls Himself " *Image* of thee in *all* things." (VI.736) and claims " *all* Regal Pow'r Giv'n me " (V.739). When He returns,

> Sole Victor from th' expulsion of his Foes . . .
> To meet him all his Saints, who silent stood
> Eye-witnesses of his *Almighty Acts*
> With Jubilee advanc'd. (VI.880-884)

After the sin of Adam and Eve, the Son goes to judge the transgressors.

> Thus saying from his radiant Seat he rose
> Of high *collateral* glory : . . .
> To sentence Man : the *voice of God* they heard
> Now walking in the Garden, . . . till *God*
> Approaching, thus to Adam call'd aloud.
> (X.86-102)

The hymn to the Trinity (described III.372-411) is focused on the Son, and at its close Milton himself exultantly addresses Him :

> Hail Son of God, Savior of Men, thy Name
> Shall be the copious matter of my Song
> Henceforth, and never shall my Harp thy praise
> Forget, nor from thy Father's praise disjoin.
> (III.412)

Is Milton saying in the following that the Son was created ?

> Thee next they sang of all creation first,
> Begotten Son, Divine Similitude. (III.383)

The grammar permits a reading that is consonant with Milton's frequent and characteristic poetic inversion of common word order as well as with the numerous passages cited above : Next they (the angels), of all creation first, sang thee, begotten Son. " Second to thee " (III.409) and " Second Omnipotence " (VI.684) may as readily mean second in order as second in time or degree, for knowledge must logically, though not necessarily chronologically, follow being. And

omnipotence loses its meaning if it is susceptible of difference in degree.

The basic theology of the Incarnation is succinctly stated by the Father :

> Their Nature also to thy Nature join ;
> And be thyself Man among men on Earth,
> Made flesh, when time shall be, of Virgin seed,
> By wondrous birth : Be thou in Adam's room
> The Head of all mankind, though Adam's Son.
> (III.282)

The Holy Spirit is invoked by Milton at the beginning of his poem.

> And chiefly Thou O Spirit, that dost prefer
> Before all Temples th' upright heart and pure,
> Instruct me, for Thou know'st ; Thou from the first
> Wast present, and with mighty wings outspread
> Dove-like satst brooding on the vast Abyss
> And mad'st it pregnant : (I.17)

At the end, Michael assures Adam that when the Son has redeemed man and resumed his seat at the Father's right hand,

> from Heav'n
> He to his own a Comforter will send,
> The promise of the Father, who shall dwell
> His Spirit within them, and the Law of Faith
> Working through love upon their hearts shall write,
> To guide them in all truth, . . . for the Spirit
> Pour'd first on his Apostles, whom he sends
> To evangelize the Nations, then on all
> Baptiz'd, shall them with wondrous gifts endue
> To speak all Tongues, and do all Miracles,
> As did their Lord before them. (XII.485-502)

The Trinity is hymned by the angelic choirs :

> Thee Father first they sung Omnipotent, . . .
> Thee next they sang of all Creation first
> Begotten Son, Divine Similitude, . . .
> on thee
> Impresst the effulgence of his Glory abides,
> Transfus'd on thee his ample Spirit rests.
> (III.372-389)

The internal fellowship of the Three Persons is implied when Adam, pleading for a companion for himself, says to God :

> Thou in thy secrecy although alone
> *Best with thyself accompanied,* seek'st not
> Social communication, . . . (VIII.427)

In the Trinity " the several Persons are the several subsisting relations really distinct from each other " [1] in origin (in order, not time) but one and the same in substance ; analogously, in man, who is made in the image of God, being, knowing, and willing are distinct. In God these acts are so intense, so complete, that each is a Person. The Three Persons have one and the same essence, and every external operation of God is due to the whole Trinity and cannot be attributed to one Person alone except by appropriation. Saint Thomas explains with respect to creation :

> To create belongs to God according to His being, that is, His essence, which is common to the three Persons. Hence to create . . . is common to the whole Trinity. Nevertheless, the divine Persons, according to the nature of their procession, have a causality respecting the creation of things. Hence . . . the Father made the creature through His Word, which is His Son ; and through His Love, which is the Holy Ghost . . . The power of creation, whilst common to the three Persons, belongs to them in a kind of order. For the Son receives it from the Father, and the Holy Ghost from both. [2]

In *Paradise Lost* the Father, having freely chosen to create the world, addresses the Son :

> And thou my Word, begotten Son, *by thee*
> This *I* perform, speak thou, and be it done :
> My overshadowing *Spirit* and might with thee
> I send along, ride forth, and bid the Deep
> Within appointed bounds be Heav'n and Earth.
> (VII.163)

The poem shows creation as the work of the Three Persons :

> Heav'n op'n'd wide
> Her ever-during Gates, Harmonious sound
> On golden Hinges moving, to let forth
> The *King of Glory* in his powerful *Word*
> And *Spirit* coming to create new Worlds.
> (VII.205)

Besides the Trinity, we may consider here one other theological question : How nearly can the account of creation in *Paradise Lost* be interpreted in accord with Catholic orthodoxy ?

> Thus God the Heav'n created, thus the Earth
> Matter unform'd and void . . .
> And vital virtue infus'd, and vital warmth
> Throughout the fluid Mass, but downward purg'd
> The black tartareous cold Infernal dregs
> Adverse to life. (VII.232-239)

1. Saint Thomas, I, q.30, a.2.
2. *Ibid.*, I, q.45, a.6. Cf. *Gen.* 1:2, John 1:3.

Light had not yet been created. It is worth noting that *black* and *cold* are negative terms, as modern science explains. Milton asserts that God created matter unformed. It is interesting to notice how closely these lines of Milton parallel Saint Augustine.

> Since therefore God began creating with the heavens and the earth, and the earth itself, as Scripture adds, was at first invisible and formless, light not being as yet made and darkness covering the face of the deep (that is to say, covering an undefined chaos of earth and sea) for where light is not darkness must be. [1]

Saint Augustine teaches that God created this matter out of nothing — nothing being the absence, not the presence, of a material cause. The things created are the external realization of the immaterial exemplars in the mind of God, in a finite way, as Milton expresses it, " answering his great Idea " (*PL*, VII.557). The Son, who created them by his " Omnific Word " (217), summoned them out of nothing, for " immediate are the Acts of God " (176).

Under the supposition that God created matter out of nothing by His Will, according to His exemplars or ideas, we may thus understand Milton : Chaos is the realm of unformed matter. Night is pure negation outside the formless but circumscribed matter.

> Boundless the deep, because I am who fill
> Infinitude, nor vacuous the space. (VII.168)

The space is not vacuous because God fills the infinitude of the Night or the Deep beyond created matter by virtue of His immensity. As Saint Thomas remarks :

> To be everywhere absolutely . . . belongs to God alone. For whatever number of places be supposed, even if an infinite number be supposed besides what already exist, it would be necessary that God should be in all of them . . . as to His very self. [2]

God expresses His complete freedom to create or not :

> Though I uncircumscrib'd myself retire,
> And put not forth my goodness, which is free
> To act or not, Necessity or Chance
> Approach not me, and what I will is Fate.
> (VII.170)

God, free to act or not, at various times (days) chooses to put forth His goodness, and wins from Chaos by the act of creation new worlds raised to order — the cosmos.

1. *De Civitate Dei* XI.9. Cf. *Gen.* 1:2 ; also Saint Thomas, I, q.66, a.1.
2. Saint Thomas, I, q.8, a.4.

Milton seems to favor a limited evolution :

> The Earth was form'd but in the Womb as yet
> Of Waters, Embryon immature involv'd,
> Appear'd not. (VII.276)

Similarly Saint Augustine observes :

> As in the seed there are invisibly and at one time all the things which in course of time will grow into a tree, so the universe must be conceived . . . having had at the same time all things which were made in it and with it . . . but also those things which earth and water produced potentially and causally, before in the course of time they came into being in the shape in which they are now known to us. [1]

With respect to the Three Persons of the Trinity and the work of creation, as the quoted passages witness, *Paradise Lost* seems in harmony with the teaching of Catholic theologians. Especially in expressing the equality of the Son with the Father, the poem appears to accord with Catholic dogma ; at least, it would hardly lead the ordinary reader to suspect its author of the heresies he had set forth in *De Doctrina Christiana.*

Since *Paradise Lost* is not, however, a theological treatise but a narrative poem, the question arises, what is the religious and artistic impact of its story and its characters on the reader ?

III

Its very magnitude confers on *Paradise Lost* a fundamental grandeur. In one magnificently constructed epic poem Milton depicts the vast sweep of events from the creation of the angels to the Last Judgment, events that had inspired the cycles of the medieval miracle plays. He dramatically presents the titanic struggle of the forces of Good and Evil and in particular their struggle for the soul of man. Both the lines of conflict and the opposing characters, sharply drawn, are powerful in their moral and artistic implications.

In trial of their fidelity God commanded the angels to adore His Son (V.600-615). Lucifer refused and led a revolt (V.597). The Son drove the rebels over the abyss to fall nine days into Hell (VI.801). There we meet them at the opening of the poem, for, in accordance with epic tradition, Milton plunges *in medias res.* The action of the poem therefore begins when Satan, awakening in the fiery gulf that flamed with " no light but rather darkness visible " (I.63), conceives a plan of revenge on God by ruining man (I.650), who is destined to replace the fallen angels (VII.150). By imbruting himself (IX.166) Satan seduces Eve and, through her, Adam and returns to Hell expecting

1. *De Genesi ad litteram* V. xxiii.45.

triumph, but instead he is greeted by hisses and he experiences the degradation of himself and his fellow rebels (X.541). This ironical denouement shows that the antagonist [1] " Arch Angel ruin'd " (I.593) contends in vain against the protagonist Son of God. By incarnating Himself the Son through love and mercy (X.58, 209-223) initiates a counter-action, redeems the souls of men corrupted through Satan's hate and desire for revenge, outwits Satan, Death, and Sin (XI.55-66, 359), wins hope and joy out of despair (139, 167), and returns to heaven as victor with the multitude He has saved (III.250-261) ; VI.880-892 ; X.613-639 ; XII.390, 410, 431, 469-478).

Adam, like Othello, is acted upon. On his fall the whole poem is focused. As the central theme it is mentioned in the first line and it constitutes the turning point of the plot (IX.906). Like the peripety of *Œdipus the King*, it has the quality of irony. To Satan, Adam's fall appears as consummate victory and revenge, whereas it is really a " happy fault " that makes manifest the great love of the Redeemer (XII.471), for God knows how to draw good out of evil, as the revelations to Adam in the last two books show. Adam's flaw is his excessive and ill-ordered love of Eve. " Was she thy God ? " (X.145) All sin implies a similar disorder.

Satan, like Iago, initiates the action and, though evil, he is a superb artistic creation. Milton first introduces him as a villain (as the words I have italicized below clearly show).

> . . . say first what cause
> Mov'd our Grand Parents in that happy State,
> Favour'd of Heav'n so lightly, to fall off
> From their Creator and transgress his Will
> For one restraint, Lords of the World besides ?
> Who first *seduc'd* them to that *foul revolt* ?
> Th' *infernal Serpent* ; he it was whose *guile*
> Stirr'd up with *Envy* and *Revenge, deceiv'd*
> The Mother of Mankind, what time his *Pride* . . .
> Against the Throne and Monarchy of God
> Raised *impious War* . . . (I.28-43)

Likewise Milton ejects Satan ignominiously just when he exultingly awaits acclaim :

> . . . Ye have th' account
> Of my performance : What remains, ye Gods,
> But up and enter now into full bliss.
> So having said, a while he stood, expecting
> Their universal shout and high applause
> To fill his ear, when contrary he hears
> On all sides, from inumerable tongues

1. Satan calls himself " antagonist " X.387 ; cf. also II.509.

A dismal universal hiss, the sound
Of public scorn ; he wonder'd, but not long
Had leisure, wond'ring at himself now more ;
His Visage drawn he felt to sharp and spare,
His Arms clung to his Ribs, his Legs entwining
Each other, till supplanted down he fell
A monstrous Serpent on his Belly prone,
Reluctant, but in vain, a greater power
Now rul'd him, punisht in the shape he sinn'd,
According to his doom ; he would have spoke,
But hiss for hiss return'd with forked tongue
To forked tongue, for now were all transform'd
Alike, to Serpents all as accessories
To his bold Riot : . . .
Thus was th' applause they meant,
Turn'd to exploding hiss, triumph to shame
Cast on themselves from their own mouths.
(X.501-547)

In view of this evidence, can anyone judiciously hold that Milton really admires Satan, as some critics contend ? It must be remembered that Satan is a powerful dramatic figure whose acts and words the artist who created him need not approve. He is drawn on a grander scale than Goethe's Mephistopheles, and he is much more complex and subtle than Manfred or any other example of the boldly cynical Byronic man (whom apparently Byron does approve). It is true that in his very first speech to Beelzebub as they lie vanquished after their fall, Satan manifests an indomitable spirit, a quality which usually evokes admiration.

What though the field be lost ?
All is not lost ; the unconquerable Will,
And study of revenge, immortal hate,
And courage never to submit or yield :
And what is else not to be overcome ?
That Glory never shall his wrath or might
Extort from me. To bow and sue for grace
With suppliant knee, and deify his power
Who from the terror of this Arm so late
Doubted his Empire, that were low indeed,
That were an ignominy and shame beneath
This downfall ; . . .
Since through experience of this great event . . .
We may with more successful hope resolve
To wage by force or guile eternal War
Irreconcilable, to our grand Foe, . . . (I.105-122)

But Milton immediately hastens to point out the divergence between his words and his true interior state.

So spake th' Apostate Angel, though in pain,
Vaunting aloud, but rackt with deep despair.
(I.125)

Satan utters other vaunts (I.263, 657-662 ; II.11-17, 445-456 ; V.859-871 ; VI.282-295), but, as Raphael later remarks, there is a distinction between the strong and the admirable. [1]

For strength from Truth divided and from Just,
Illaudable, naught merits but dispraise
And ignominy, yet to glory aspires
Vain-glorious, and through infamy seeks fame.
(VI.381)

In contrast, true and unfailing strength is in the Son, for it is the Son, majestically drawn, whom Milton shows throughout the poem directly opposed to Satan. The Son declares to all His host the part the Father has appointed Him in the war against the rebellious followers of Lucifer :

Therefore to me their doom he hath assign'd ;
That they may have their wish to try with me
In Battle which the stronger proves, they all,
Or I alone against them, since by strength
They measure all, . . . (VI.817)

Then the invincible Son resplendent

. . . in Celestial Panoply all arm'd
. . . on the wings of Cherub rode sublime . . .
At his command the uprooted Hills retir'd
Each to his place, they heard his voice and went
Obsequious, Heav'n his wonted face renew'd
And with fresh Flow'rets Hill and Valley smil'd . . .
He on his impious Foes right onward drove, . . .
Grasping ten thousand Thunders, . . .
they astonisht all resistance lost,
All courage ; down their idle weapons dropp'd ; . . .
Yet half his strength he put not forth, but . . .
Drove them before him Thunder-struck, pursu'd
With terrors and with furies to the bounds
And Crystal wall of Heav'n, . . .
headlong themselves they threw
Down from the verge of Heav'n, . . .
Nine days they fell ; . . . Hell at last
Yawning receiv'd them whole, and on them clos'd, . . .
(760-875)

1. Cf. Machiavelli, *Il Principe*, chap.VIII, admitting that Agathocles was a great captain, but denying him glory.

There, defeated but implacably confirmed in rebellion, Satan proclaims to Beelzebub his direct challenge of God :

> If then his Providence
> Out of our evil seek to bring forth good,
> Our labour must be to pervert that end,
> And out of good still to find means of evil.
> (I.162)

Even while Satan speaks thus, Milton discloses what is the true situation.

> So stretcht out huge in length the Arch-fiend lay
> Chain'd on the burning Lake, nor ever thence
> Had ris'n or heav'd his head, but that the will
> And high permission of all-ruling Heaven
> Left him at large to his own dark designs,
> That with reiterated crimes he might
> Heap on himself damnation, while he sought
> Evil to others, and enrag'd might see
> How all his malice serv'd but to bring forth
> Infinite goodness, grace, and mercy shown
> On Man by him seduc't, but on himself
> Treble confusion, wrath and vengeance pour'd.
> (I.209)

It is in soliloquy, however, in accordance with dramatic convention, that Satan speaks the truth. He reveals " The Hell within Him " (IV.20), and he acknowledges :

> . . . Pride and worse Ambition threw me down
> Warring in Heav'n against Heav'n's matchless King :
> And wherefore ! he deserv'd no such return
> . . . nor was his service hard.
> What could be less than to afford him praise,
> The easiest recompense, and pay him thanks,
> How due ! yet all his good prov'd ill in me,
> And wrought but malice. (IV.40-49)

He confesses his base motive, that he could not endure

> . . . endless gratitude,
> So burthensome, still paying, still to owe ;
> Forgetful what from him I still receiv'd,
> And understood not that a grateful mind
> By owing owes not, but still pays, at once
> Indebted and discharged ; what burden then ? (53)

He reflects that many angels did not fall and he asks himself :

> Hadst thou the same free Will and Power to stand ?
> Thou hadst ; whom hast thou then or what to accuse,
> But Heav'n's free Love dealt equally to all ? (66)

So deep, however, is the malice of his " fixt mind And high disdain " (I.97), that he curses both God and himself :

> Be then his Love accurst, since love or hate,
> To me alike, it deals eternal woe.
> Nay curs'd be thou ; since against his thy will
> Chose freely what it now so justly rues. (69)

His tortured ruing is sheer despair.

> Me miserable ! which way shall I fly
> Infinite wrath, and infinite despair?
> Which way I fly is Hell : myself am Hell ;
> And in the lowest deep a lower deep
> Still threatening to devour me opens wide,
> To which the Hell I suffer seems a Heav'n. (73)

Like King Claudius in *Hamlet*, Satan vainly seeks the relief of repentance, but ends only in bitter and barren remorse. He perversely chooses evil as his good and renews his malicious aspiration of revenge.

> O then at last relent ; is there no place
> Left for Repentance, none for Pardon left?
> None left but by submission ; and that word
> *Disdain* forbids me, and my dread of shame
> Among the Spirits beneath, whom I seduc'd
> With other promises and other vaunts
> Than to submit, boasting I could subdue
> Th' Omnipotent . . .
> But say I could repent and could obtain
> By Act of Grace my former state ; how soon
> Would height recall high thoughts, . . .
> Which would but lead me to a worse relapse, . . .
> This knows my punisher ; therefore as far
> From granting he, as I from begging peace : . . .
> So farewell Hope, and with Hope farewell Fear,
> Farewell Remorse : all Good to me is lost ;
> Evil be thou my Good ; by thee at least
> Divided Empire with Heav'n's King I hold
> By thee, and more than half perhaps will reign ;
> As Man ere long, and this new World shall know.
> (79-113)

As the moment of his revenge approaches, Satan, having circled the Earth and beheld its beauty, reiterates his own misery and malignant intent.

> With what delight could I have walkt thee round
> If I could joy in aught, . . .
> but I in none of these
> Find place or refuge ; and the more I see

Pleasures about me, so much more I feel
Torment within me, as from the hateful siege
Of contraries ;[1] all good to me becomes
Bane, and in Heav'n much worse would be my state.
. . . I seek, but others to make such
As I, though thereby worse to me redound :
For only in destroying I find ease
To my relentless thoughts. (IX.114-130)

To compass his revenge, Satan determines to imbrute himself in the serpent, even though his whole being shrinks from so base a degradation.

O foul descent ! that I who erst contended
With Gods to sit the highest, am now constrain'd
Into a Beast, and mixt with bestial slime,
This essence to incarnate and imbrute,
That to the height of Deity aspir'd ;
But what will not Ambition and Revenge
Descend to ? who aspires must down as low
As high he soar'd, obnoxious first or last
To basest things. Revenge, at first though sweet,
Bitter ere long back on itself recoils ;
Let it ; I reck not, so it light well aim'd,
Since higher I fall short, on him who next
Provokes my envy, this new Favorite
Of Heav'n, this Man of Clay, Son of despite,
Whom us the more to spite his Maker rais'd
From dust : spite then with spite is best repaid.
(163)

Satan achieved his malicious purpose ; Adam and Eve fell. Immediately their fall was known in Heaven and the Father sent the Son to judge the transgressors and promise them mercy (X.58-62), because they fell, not self-tempted, like the angels, but deceived (III.130). In view of this human defect, the Son, foreknowing their fall, had freely offered, long before the event, to redeem men, and now, after it, He reiterates the offer (X.71-79).

To accentuate the direct opposition between Satan and the Son of God in contending for the soul of man, Milton presents the Son's offer to undertake man's redemption in close rhetorical parallel to Satan's offer to undertake his destruction. In both passages, the question who shall go on this important mission (II.402-416 ; III,209-216) evokes mute consternation among the assembled spirits (II.417-426 ; III.217-224) until at last (II.426-429 ; III.224-226) one accepts

1. For a discussion of the emotional impact of contraries, especially in Renaissance literature, see Sister Miriam Joseph, c.s.c., *Shakespeare's Use of the Arts of Language* (New York, 1947), pp.131-133.

(II.430-444 ; III.236-265). Summarizing the situation which will involve an encounter with Sin and Death, the Son of God speaks to His Father in behalf of man :

> Behold me then, me for him, life for life
> I offer, on me let thine anger fall ;
> Account me man ; I for his sake will leave
> Thy bosom, . . . and for him lastly die
> Well pleas'd, on me let Death wreck all his rage ; . . .
> But I shall rise Victorious and subdue
> My vanquisher, spoil'd of his vaunted spoil ;
> Death his death's wound shall then receive, and stoop
> Inglorious, of his mortal sting disarm'd. (III.236-263)

Raphael, sent to prepare Adam for his trial, warns him that if he eats of the forbidden tree,

> Death is the penalty impos'd, beware,
> And govern well thy appetite, lest sin
> Surprise thee, and her black attendant Death.
> (VII.545)

In contrast to Satan's barren remorse is the contrite repentance of Adam and Eve (X.1086-92). Hardly had they ended their prayer when, through their Advocate in Heaven, they found new hope, strength, joy, and peace (XI.136-158). Sent by God, Michael informs Adam that Death is delayed in order to allow them time to atone for their sin with good deeds (252-258).

Through a series of visions and narration Michael reveals to Adam the history of his descendants in which God's grace contends with the sinfulness of men (359). First he impresses upon him the hereditary character of his sin (423-428) ; cf. IX.415), and he shows him the violent deed of Cain that wrought on Abel the first death of man on earth. Then follow visions of death coming in many shapes, through disease, war, and the deluge. At the sight of the misery his sin has caused, Adam is overcome with the burden of his wrong (XI.763-786) until he finds in Noah a descendant in whom he can rejoice. He also learns that obedience to laws and rites revealed through Moses so delights God that He makes His tabernacle with men (XII.245). Milton beautifully celebrates the part the Virgin Mary played in the Redemption. Hearing of his Redeemer's birth, Adam bursts out in joy :

> Virgin Mother, Hail,
> High in the love of Heav'n, yet from my Loins
> Thou shalt proceed, and from thy Womb the Son
> Of God most High ; so God with men unites.
> Needs must the Serpent now his capital bruise
> Expect with mortal pain : (XII.379)

For Adam had heard the curse upon the Serpent

> . . . then verifi'd
> When Jesus son of Mary second Eve,
> Saw Satan fall like Lightning down from Heav'n,
> (X.182)

Satan, too, derisively reported it to his followers :

> His Seed, when is not set, shall bruise my head ;
> A World who would not purchase with a bruise ? [1]
> (499)

But now Michael reveals to Adam how his Seed, the Son of God, in time, shall vanquish Satan, Sin, and Death :

> . . . thy punishment
> He shall endure by coming in the Flesh . . .
> Seiz'd on by force, judg'd and to death condemn'd
> A shameful and accurst, nail'd to the Cross
> By his own Nation, slain for bringing Life ;
> But to the Cross he nails thy Enemies,
> The Law that is against thee, and the sins
> Of all mankind, with him there crucifi'd,
> . . . so he dies,
> But soon revives, Death over him no power
> Shall long usurp ; ere the third dawning light,
> Return, the Stars of Morn shall see him rise
> Out of his grave, fresh as the dawning light,
> Thy ransom paid, which Man from death redeems,
> . . . the benefit embrace
> By Faith not void of works : this God-like act
> Annuls thy doom, the death thou shouldst have di'd
> In sin for ever lost from life ; this act
> Shall bruise the head of Satan, crush his strength
> Defeating Sin and Death, his two main arms, . . .
> Then to the Heav'n of Heav'ns he shall ascend
> With victory . . .
> Then enter into glory, and resume
> His Seat at God's right hand, . . . (XII.404-457)

Recognizing God's surpassing Providence, Adam exclaims (in the spirit of the liturgy of Holy Saturday, *O felix culpa*) :

> O goodness infinite, goodness immense !
> That all this good of evil shall produce,
> And evil turn to good ; more wonderful
> Than that which by creation first brought forth
> Light out of darkness ! full of doubt I stand,

1. Cf. *Othello*, IV.iii.64.

Whether I should repent me now of sin
By me done and occasion'd, or rejoice
Much more, that much more good thereof shall spring,
To God more glory, more good will to Men
From God, and over wrath grace shall abound. (469)

And so the mighty conflict between the antagonist Satan and the protagonist Son ends with grace abounding for man. Satan freely chose evil as his good, the particularly malevolent evil of revenge on God by the ruination of man. The Son drew good out of this evil by redeeming man and reopening Heaven to him. Yet the conflict goes on, for every man must freely choose for himself either to accept the grace of redemption or to reject it.

IV

In this brief review of the story of *Paradise Lost*, some important ideas are implicit, but we shall now discuss explicitly a few moral and philosophical ideas in the poem. And first free will.

Milton is an ardent champion of free will. He emphatically asserts that God gave sufficient grace to the angels, to Adam, and to his progeny and that His foreknowledge and predestination of the elect in no way interferes with the exercise of their free will. In order to relate the fall of Adam, which was foreseen before Satan journeying from Hell had yet arrived on Earth, to the central theme of *Paradise Lost* expressed at its opening, Milton employs rhetorical parallelism : " whose fault ? " (III.96) echoes " what cause " (I.28), and in the two passages the pattern that follows the question is similar. The Father, foreseeing Adam's fall, speaks of it to His Son :

. . . whose fault ?
Whose but his own ? ingrate, he had of me
All he could have ; I made him just and right,
Sufficient to have stood, though free to fall.
Such I created all th' Ethereal powers
And Spirits, both them who stood and them who fail'd ;
Freely they stood who stood, and fell who fell.
. . . nor can justly accuse
Their maker, or their making, or their Fate ;
As if predestination over-rul'd
Their will, . . . they themselves decreed
Their own revolt, not I : if I foreknew,
Foreknowledge had no influence on their fault, . . .
So without least impulse or shadow of Fate,
Or aught by me immutably foreseen,
They trespass, Authors to themselves in all
Both what they judge and what they choose ; for so
I form'd them free, and free they must remain

> Till they enthrall themselves : else I must change
> Their Nature, and revoke the high Decree
> Unchangeable, Eternal, which ordain'd
> Their freedom, they themselves ordain'd their fall.
> (III.96-128)

Milton insists on the necessity of prevenient grace which, while showing man's complete dependence on God, enhances his freedom. The Father continues :

> Man shall not quite be lost, but sav'd who will,
> Yet not of will in him, but grace in me
> Freely voutsaf't ; once more I will renew
> His lapsed powers, though forfeit and enthrall'd
> By sin to foul exorbitant desires ;
> Upheld by me, yet once more he shall stand . . .
> By me upheld, that he may know how frail
> His fall'n condition is, and to me owe
> All his deliv'rance, and to none but me.
> (173-182)

When, in time, Adam and Eve have fallen, Milton re-emphasizes their dependence on grace.

> Thus they in lowliest plight repentant stood
> Praying, for from the Mercy seat above
> Prevenient Grace descending had remov'd
> The stony from their hearts, . . . (XI.1)

The Son, their great Intercessor, presenting their prayers to His Father, comments further on grace :

> See Father, what first fruits on Earth are sprung
> From thy implanted Grace in Man, these Sighs
> And Prayers, which in this Golden Censer, mixt
> With Incense, I thy Priest before thee bring, . . . (23)

Most impressive, however, are Milton's ardent and reiterated assertions that free will is not only consonant with obedience but dependent on it. This thesis, one of the most important in *Paradise Lost*, is structurally imbedded in this poem whose action, vast in space and time, moves under the Eye of Eternity, for the Godhead, majestic and serene in its Omniscient Now, sees rebellion rising in the first " abstrusest thoughts " of Lucifer and his cohorts (V.711-715) and likewise, observing Satan " Coasting the wall of Heav'n " (III.71) and preparing to alight on Earth, decrees Mercy and Redemption *before* man falls despite his freedom. Beholding Adam at prayer and work in Eden (V.209-220), God mercifully sends Raphael to warn him

that his will is free yet mutable (235). Raphael instructs Adam in particular on the relation of obedience and love to freedom :

> Myself and all th' Angelic Host that stand
> In sight of God enthron'd, our happy state
> Hold, as you yours, while our obedience holds ;
> On other surety none ; freely we serve,
> Because we freely love, as in our will
> To love or not ; in this we stand or fall :
> And some are fall'n, to disobedience fall'n,
> And so from Heav'n to deepest Hell ; O fall
> From what high state of bliss into what woe !
> (V.535)

Then, to fortify instruction by example, Raphael narrates the revolt with consequent loss of liberty of the disobedient angels (V.792-VI.664) and the victory through strength of innocence of the obedient hosts (VI.398-405). Before parting from him, Raphael earnestly summarizes his mission to prepare Adam for his trial by reminding him that the happiness not only of himself but also of his descendants depends upon the proper use of his free will and that woe will follow its misuse, if disordered love or passion blind his judgment (VIII.633-643).

In the human story Milton treats freedom in relation to both the obedience which man owes to God and that which a wife owes to her husband. Thoroughly instructed by Raphael, Adam explains to Eve the nature of free will, subject to surprise and deceit. He warns her not rashly to lay herself open to temptation by separating herself from him in their work, but rather to avoid it, for trial will come unsought (IX.342-363). Conscious of her free will (284), Eve nevertheless persists in her plan to work by herself. Deceived by the Serpent, she eats of the forbidden tree and afterwards offers it to Adam. He, freely choosing to cast his lot with hers and die with her rather than live without her (906, 952), also eats (997). After this disobedience has begun to work its deteriorating effects in both of them, Eve blames her husband for weakly yielding to her, but Adam reasserts that he left her free (1171-74).

At every opportunity, Milton continues to stress free will. The allseeing, omniscient God does not hinder Satan from tempting man, who is " with strength entire and free Will arm'd " (X.9). The Eternal Father bids the returning angelic guard not to be dismayed at their unsuccessful watch over man, for their sincerest care could not prevent his fall. It resulted from his own misuse of free will, an act foreseen and foretold, but, far from being necessitated by divine decree, it was untouched by lightest impulse (X.34-47).

In the last book of the poem, when Michael narrates to Adam the events of human history " Betwixt the world destroy'd and world

restor'd " (XII.3), the story of Nimroc and Babel expresses a scorn for tyranny, which usurps authority and violates the freedom and just order of man's relation to man in civil society (24-101). Through the comments of Michael rings Milton's own conviction derived from his political experience that personal servitude to passion (the heritage of Adam's original lapse) reduces to political servitude.

> Man till then free. Therefore since he permits
> Within himself unworthy Powers to reign
> Over free Reason, God in Judgment just
> Subjects him from without to violent Lords ; . . .
> Deprives them of their outward liberty,
> Their inward lost : (XII.89-101)

Not only does Milton thus forcefully reiterate the freedom of the will at every strategic point in the structure of his poem, but he expresses it most eloquently in the debates between Abdiel [1] and Lucifer. This is especially significant because in Abdiel Milton has created the character he apparently admires most, and the reader quickly senses that what Abdiel says Milton himself fervently holds.

Lucifer assures his followers, one of whom at this point is Abdiel, that they are all equally free, for their differences in order and degree do not jar with liberty, but he declares that to obey the Father's command to adore the Son would be intolerable servitude (V.772-802). Abdiel, " than whom none with more zeal " obeys divine commands, vehemently denies his assertion that it is " Flatly unjust, to bind with Laws the free " (819). He asks Lucifer if he will dispute the points of liberty with God who made him, who, provident of their good and dignity, is bent rather to exalt their happy state by this command, since by acknowledging the Son's reign, their own glory is not obscured but " more illustrious made " (842). Defiantly Lucifer bids Abdiel watch them try by proof who is their equal when they gird " th' Almighty Throne Beseeching or besieging " (868).

Clearly understanding that in law there is freedom, Abdiel warns Lucifer that in revolt he will find not liberty but slavery, for

> That Golden Scepter which thou didst reject
> Is now an Iron Rod to bruise and break
> Thy disobedience. (886)

When Lucifer accuses the angels that come against him of servility, Abdiel flings the charge back at him in ringing tones by sharply distinguishing his false concept of servitude from the true.

> Unjustly thou deprav'st it with the name
> Of Servitude to serve whom God ordains,

1. Abdiel is the name of a human being, a descendant of Gad mentioned in *I Paralipomenon* 5:15.

Or Nature ; God and Nature bid the same,
When he who rules is worthiest, and excels
Them whom he governs. This is servitude,
To serve th' unwise, or him who hath rebell'd
Against his worthier, as thine now serve thee,
Thyself not free, but to thy self enthrall'd.
(VI.174)

Lucifer's followers experience the first effects of the enthrallment resulting from their disobedience when they first feel fear and pain and ignominiously flee before the conquering host (394). One bitterly complains :

. . . too unequal work we find
Against unequal arms to fight in pain,
Against unpain'd, impassive ; from which evil
Ruin must needs ensue ; for what avails
Valor or strength, though matchless, quell'd with pain
Which all subdues, . . .
But pain is perfect misery, the worst
Of evils, and excessive, overturns
All patience. (VI.453-464)

V

The abuse of free will raises questions about the nature of evil and certain of its interrelated aspects.

Evil is negative. It is a defect, a lack of good. The only essential evil is sin. Sin is in the will. The will chooses sin as a good, a gratification of pride, sensuality, or avarice ; but at the same time the intellect, though darkened, knows the act is evil in that it is a deflection from the true good. A characteristic of sin in the conscious choice of an apparent rather than a real good. A determination to overcome this confusion between reality and appearance is expressed in the motto *Esse quam videri*, a theme strongly emphasized not only in *Paradise Lost* but in the work of Spenser, Shakespeare, and many other Renaissance writers.[1] Hypocrisy is the deliberate concealment of reality with a false appearance.

Sin is seeking self instead of God. The intellect, knowing self to be finite and created, recognizes that preferring self, the creature, to God, the Creator, is evil, is a defect. It is a monstrous disproportion, a perversion of order. It denies in practice the dependence of the creature on the Creator. It falsely regards the creature as self-sufficient. The creature sets himself up as his own providence, indulges a false independence and security. Saint Thomas analyzes this as the essential perversion of the sin both of Lucifer and of Adam :

1. This theme is treated in detail by THEODORE SPENCER in *Shakespeare and the Nature of Man* (New York, 1943). See also Sister MIRIAM JOSEPH, *op. cit.*, pp.110f.

But he [the devil] desired resemblance with God in this respct, — by desiring, as his last end of beatitude, something which he could attain by the virtue of his own nature, turning his appetite away from supernatural beatitude, which is attained by God's grace. Or, if he desired as his last end that likeness of God which is bestowed by grace, he sought to have it by the power of his own nature ; and not from Divine assistance according to God's ordering. . . . He sought to have final beatitude of his own power, whereas this is proper to God alone. [1]

Accordingly, while both (namely the devil and the first man) coveted God's likeness inordinately, neither of them sinned by coveting a likeness of nature. But the first man sinned chiefly by coveting God's likeness, as regards *knowledge of good and evil*, according to the serpent's instigation, namely that by his own natural power he might decide what was good, and what was evil for him to do ; or again that he should of himself foreknow what good and what evil should befall him. Secondarily he sinned by coveting God's likeness as regards his own power of operation, namely that by his own natural power he might act so as to obtain happiness . . . Nevertheless both coveted somewhat to be equal to God, in so far as each wished to rely on himself in contempt of the order of the Divine rule. [2]

The ancient Greeks, whose writings strongly influenced Milton, called this overconfidence of men in their own power hybris. For denying his dependence on them, the gods would punish a man and abandon him to suffer ruin. Agamemnon, for example, arrogates to himself an honor reserved to the gods in walking on the purple tapestry. Therefore the gods abandon him, and Clytemnestra succeeds in killing him. That is just what she wanted. That is why she induced him to walk on the tapestry. Milton's Samson commits hybris (*SA*, 496-501, 529-540) and God abandons him until he humbly repents. The Greek writers regarded hybris as the worst form of excess. Æschylus especially condemns excess and praises moderation. The theme of temperance as opposed to excess is outstanding in Spenser, whom Milton admired and imitated. In angels, excess takes the form of pride ; in men, pride or sensuality. These then are closely interrelated aspects of evil : the confusion of appearance and reality, hypocrisy, hybris, excess. They are strikingly illustrated in *Paradise Lost.*

But first the question may arise, if evil is negative, can it exist and can it enter into the mind of God ? Milton writes :

> Evil into the mind of God or man
> May come and go, so unapprov'd, and leave
> No spot or blame behind. (V.117)

Saint Thomas comments :

Whoever knows a thing perfectly must know all that can be accidental to it. Now there are some good things to which corruption by evil may be

1. I, q.63, a.4.
2. II, II, q.163, a.4. Cf. Luke 12:16-21.

accidental. Hence God would not know good things perfectly unless He also knew evil things. Now a thing is knowable in the degree in which it is ; hence, since this is the essence of evil that it is the privation of good, by the very fact that God knows good things He knows evil things also ; as by light is known darkness . . . The knowledge of God is not the cause of evil ; but is the cause of the good whereby evil is known . . . To know a thing by something else only, belongs to imperfect knowledge, if that thing is of itself knowable ; but evil is not of itself knowable, forasmuch as the very nature of evil means the privation of good ; therefore evil can neither be defined nor known except by good. [1]

In *Paradise Lost*, Michael, addressing Lucifer, reveals how evil originated and how it spread :

> Author of evil, unknown till thy revolt,
> Unnam'd in Heav'n, now plenteous, . . .
> Heav'n casts thee out . . .
> Hence then, and evil go with thee along
> Thy offspring, to the place of evil, Hell, . . .
> (VI.262-276)

Sin, or evil, was born when Lucifer *resolved* to revolt (V.668). How attractive Sin then seemed to him, Sin herself tells him when he sees her as she really is, detestable and foul (II.740-767). Later, deceived by his own false anticipations, Satan again gravely miscalculates the truth. Exultant over his expected triumph on returning to Hell, he addresses Sin as " Fair Daughter " (X.384), but instead of the awaited triumph he is greeted with " A dismal universal hiss " and falls prone " punish't in the shape he sinn'd " (508, 516). His pride, or hybris, led Lucifer to declare himself and his followers " self-begot, self-rais'd . . . Our puissance is our own " (V.860, 864). To Michael he declared, " The strife which thou call'st evil . . . we style The strife of Glory " (VI.289). Milton repeatedly points out in Satan the contrast between reality and appearance (italics mine).

> At last as from a Cloud his fulgent head
> And shape Star-bright *appear'd*, or brighter, clad
> With what *permissive glory* since his fall
> Was left him, or *false glitter*. (X.449)

The arch hypocrite even beguiles the faithful angel Uriel,

> For neither Man nor Angel can discern
> Hypocrisy, the only evil that walks
> Invisible, except to God alone, . . . (III.682)

Like Iago, Satan, " Artificer of Fraud . . . the first That practis'd falsehood under saintly show " (IV.121), rehearses his plan to destroy

1. I, q.14, a.10.

Adam and Eve. He will excite their minds with excessive desire to know, since it is of the Tree of Knowledge they are forbidden to eat (514-527). Although Raphael had specifically warned them against excess in knowledge (VIII.167-178), for knowledge must be desired only " within bounds " (VII.120), Satan, who, like Belial, " could make the worse appear the better reason " (II.110), manages by " fair appearing " to "misinform the Will " of Eve to do what God expressly forbade (IX.354-356). Then Adam and Eve experience the reality as contrasted with false promises, for they

> Soon found their Eyes how op'n'd, and their minds
> How dark'n'd ; innocence, that as a veil
> Had shadow'd them from knowing ill, was gone.
> (IX.1053)

Too late they realize that " that false Worm " (1068) that could " counterfeit Man's voice " (1069) has (like the witches in *Macbeth*) adhered to the letter but deceived them in the sense, for now ironically they do indeed know " Both Good and Evil, Good lost and Evil got " (1072).

Three forms of deceit contributed to the fall of Adam and Eve : the guile of the Serpent ; Adam's confusion of false and true love for Eve ; and his consequent choice of Eve rather than God.

Adam's excessive praise of Eve provokes in Raphael the first frown in Paradise. Thereupon Raphael explains to Adam the difference between passion and true love by which he should ascend to heavenly love (VIII.579-594). Failing to heed Raphael's warning that Eve should acknowledge him " her Head, And to realities yield all her shows " (574), Adam weakly consents to let her separate herself from him. When she offers him the fruit of which she has already eaten, he clearly realizes that she has been ruined by fraud and he with her (IX.906), for, " fondly overcome with Female charm " (999), he chooses death with her rather than life and God's friendship without her (954). This monstrous choice of false values for true echoes Satan's terrible " Evil be thou my good " (IV.110). Nature twice bears witness to the terrible perversion, for " God and nature bid the same " (VI.176). When Eve ate the forbidden fruit,

> Earth felt the wound, and Nature from her seal
> Sighing through all her Works gave signs of woe, (VI.782)

and when Adam ate, " Earth trembl'd from her entrails . . . at completing of the mortal Sin Original " (1000-04). This witness is, however, unnoticed by the deluded human pair.

> As with new Wine intoxicated both
> They swim in mirth, and fancy that they feel
> Divinity within them breeding wings
> Wherewith to scorn the Earth : (1008)

This is the ecstasy of their hybris. Their overconfidence began, and God had instructed Raphael to warn them against it (V.238), when they trusted too much in themselves for their security (which, we read in *Macbeth*, is " mortal's chiefest enemy "). Eve, in particular, considered their happiness too frail if they could not be secure unless they kept together (IX.339). Like Peter, she protested that the fraudulent tempter could never shake her firm faith and love (279-289). The proud foe, she objected, would hardly attack her, the weaker one, and thereby risk greater shame in being repulsed (382). Precisely to overconfidence in themselves Adam attributes their fall, but he blames Eve more than himself :

> But confidence then bore thee on, secure
> Either to meet no danger, or to find
> Matter of glorious trial ; and perhaps
> I also err'd in overmuch admiring
> What seem'd in thee so perfect, . . .
> Thus it shall befall
> Him who to worth in Women [1] overtrusting
> Lets her Will rule ; restraint she will not brook,
> And left to herself, if evil thence ensue,
> She first his weak indulgence will accuse. (1175-85)

Eve's hybris reaches its height in the exhilaration that immediately follows her sin, and in describing it Milton emphasizes both false appearance and excess (my italics) :

> . . . such delight till then, as *seem'd*,
> In Fruit she never tasted, whether true
> Or *fancied* so, through *expectation high*
> Of knowledge, *nor was Godhead from her thought.*
> *Greedily* she *ingorg'd without restraint,*
> And *knew not* eating Death. (787)

Self-centered now, Eve at first questions whether to keep to herself the new knowledge that makes her superior to Adam, then decides to share it with him (816-833). She exults when he chooses her rather than God and is intoxicated with new hopes and new joys (961-993). The contrast between the mad expectations of Adam and Eve and the reality of their degradation (1120-31) that follows is parallel to that of Satan noted above. The immediate effect of " that false Fruit " is to subject them to concupiscence (1011-50), and soon, " manifold in sin " (X.16), they indulge in mutual recrimination (IX.1131-86).

[1]. Cf. XI.632, where MILTON paraphrases the common Renaissance etymology of *woman* as *woe-man* : " But still I see the tenor of Man's woe Holds on the same, from Woman to begin. " For another example, see Sister MIRIAM JOSEPH, *op. cit.*, p.339.

Even after he has regained the friendship of God by repentance, Adam shows himself unable to distinguish between appearance and reality. When he sees the vision of Cain's race, he erroneously judges it good : " Here Nature *seems* fulfill'd in all her ends." Thereupon Michael cautions him, " Judge not what is best By pleasure, though to Nature *seeming* meet " (XI.602-604), for the wicked women that *seem* goddesses are " empty of all good " (616). When men began " to serve ungovern'd appetite," they defaced God's image, which they " did not reverence in themselves " (515-525). What seems passing fair " is really " luxury and riot " (715-717). Michael further warns Adam that certain false names deceive men, such as the false concept of glory in war, for men " styl'd great Conquerors " are really " Destroyers rightlier call'd and Plagues of men," and the false concept of fame keeps " what most merits fame in silence hid " (695-699).

VI

His own idea of what merits fame and honor Milton expresses eloquently in his characterization of Abdiel and other courageous lovers of truth and right. These characters clearly reflects his own dedication to the cause of truth as he saw it.

When Lucifer proposed revolt, only one among his followers, Abdiel, " The flaming Seraph fearless, though alone Encompass'd round with foes " (V. 875), vehemently protested against it, " but his zeal None seconded, as out of season judg'd, Or singular and rash " (849). With unstinted admiration Milton comments :

> Among the faithless, faithful only he,
> Among innumerable false, unmov'd,
> Unshak'n, unseduc'd, unterrifi'd
> His Loyalty he kept, his Love, his Zeal ;
> Nor number, nor example with him wrought
> To swerve from truth, or change his constant mind
> Though single. From amidst them forth he pass'd,
> Long way through hostile scorn, which he sustain'd
> Superior, nor of violence fear'd aught ;
> And with retorted scorn, his back he turn'd
> On those proud Tow'rs to swift destruction doom'd.
> (V.897)

Seeing " the dreadless Angel " come toward them, the good spirits rejoiced " That of so many Myriads fall'n, yet one Return'd not lost, " and thereupon the voice of God Himself

> From midst a Golden Cloud thus mild was heard.
> Servant of God, well done, well hast thou fought
> The better fight, who single hast maintain'd
> Against revolted multitudes the Cause

Of Truth, in word mightier than they in Arms ;
And for the testimony of Truth hast borne
Universal reproach, far worse to bear
Than violence : for this was all thy care
To stand approv'd in sight of God ; though Worlds
Judg'd thee perverse : (VI.28)

Like Saint Thomas More, accused at his trial of similar perverseness, [1] Abdiel shows how shortsighted even with respect to numbers is his accuser who identifies truth with the opinion held by a multitude. He retorts to Lucifer :

All are not of thy Train ; there be who Faith
Prefer, and Piety to God, though then
To thee not visible, when I alone
Seem'd in thy World erroneous to dissent
From all : my Sect thou seest, now learn too late
How few sometimes may know, when thousands err. (143)

Other lone lovers of truth whom Milton ardently admires are Enoch, Noah, and Abraham. He describes Enoch as

The only righteous in a World perverse,
And therefore hated, therefore so beset
With Foes for daring single to be just,
And utter odious Truth, . . . (XI.701)

that God exempted him from death. Noah, " the only Son of light In a dark Age . . . fearless of reproach and scorn, Or violence, " in vain admonishing men, shall be " Of them derided, but of God observ'd The one just Man alive " (808-818). Abraham is the " one faithful man " (XII.113) from whom God's Chosen People shall spring.

A modern reader may catch in current controversy echoes of some false views held by certain characters in *Paradise Lost.* Like Marx in his appeal to those who have nothing to lose but their chains, Moloch, in his summons to violent attack (II.85-105), " grounds his courage on despair " (126), as even Belial points out. Those who today propose humanism as a fourth faith, superior to the faith of Jews, Protestants, or Catholics, urge men to free themselves from superstitious fear and servitude to a mythical supernatural Power and to rely on themselves alone to overcome difficulties and gradually improve their lot in this world. This counsel to seek their own good from themselves (much in the disdainful spirit of the Byronic man) echoes that of Belial :

. . . Let us not then pursue . . . our state
Of splendid vassalage, but rather seek

1. Saint Thomas More pointed out to his shortsighted accusers that the absent and the blessed who were on his side were far more numerous than all the submissive bishops and laity of England. See Harpsfield's *Life of More* (London, 1932), p.195.

> Our own good from ourselves, and from our own
> Live to ourselves, though in this vast recess,
> Free, and to none accountable, preferring
> Hard liberty before the easy yoke
> Of servile pomp. Our greatness will appear
> Then most conspicuous, when great things of small,
> Useful of hurtful, prosperous of adverse
> We can create, and in what place soe'er
> Thrive under evil, and work ease out of pain
> Through labor and endurance. (II.249)

Much as Milton disliked war, he points out that it is possible for " Peace to corrupt no less than War to waste " (XI.784) when men " Shall change their course to pleasure, ease, and sloth, Surfeit, and lust " (794). He warns also against too great reliance on security by those who,

> . . . cool'd in zeal
> Thenceforth shall practice how to live secure,
> Worldly or dissolute, on what their Lords
> Shall leave them to enjoy ; . . .
> So all shall turn degenerate, all deprav'd. (801-806)

After she realizes her sin, Eve, in her distraught confusion, proposes willful barrenness, " yet ere Conception to prevent The Race unblest " (X.987), and even suicide (1001-06). But Adam rejects " such acts Of contumacy " and reminds her of the remedy in God's promise :

> . . . thy Seed shall bruise
> The Serpent's head ; . . . which will be lost
> By death brought on ourselves, or childless days
> Resolv'd, as thou proposest : (X.1031-38)

Milton delights in celebrating chaste and holy marriage as opposed to " Court Amours " or " the bought smile Of Harlots " (IV.765). Adam describes his first sight of Eve, the ideal woman, when after her creation he awoke.

> Such as I saw her in my dream, adorn'd
> With what all Earth or Heaven could bestow
> To make her amiable : On she came,
> Led by her Heav'nly Maker, though unseen,
> And guided by his voice, nor uninform'd
> Of nuptial Sanctity and marriage Rites :
> Grace was in all her steps, Heav'n in her Eye
> In every gesture dignity and love. (VIII.482)

Adam thanks God for this fairest of his gifts, for whom man

> . . . shall forgo
> Father and Mother, and to his Wife adhere ;
> And they shall be one Flesh, one Heart, one Soul.
> (497)

When he leads Eve to the Nuptial Bower, Nature celebrates the first holy marriage :

> . . . all Heav'n
> And happy Constellations on that hour
> Shed their selectest influence ; the Earth
> Gave sign of gratulation, and each Hill ;
> Joyous the Birds ; fresh Gales and gentle Airs
> Whisper'd it to the Woods, and from their wings
> Flung Rose, flung Odours from the spicy Shrub
> Disporting, till the amorous Bird of Night
> Sung Spousal, and bid haste the Ev'ning Star
> On his Hill top, to light the bridal Lamp. (511)

Milton sings a hymn to chaste wedlock :

> Hail wedded Love, . . . by thee
> Founded in Reason, Loyal, Just, and Pure
> Relations dear, and all the Charities
> Of Father, Son, and Brother, first were known . . .
> Perpetual Fountain of Domestic sweets, . . .
> Here Love his golden shafts employs, here lights
> His constant Lamp, and waves his purple wings.
> (IV.750-764)

When Eve laments, as any woman would, that she must leave the familiar home she has tended and adorned, Michael consoles her :

> Thy going is not lonely, with thee goes
> Thy Husband, him to follow thou art bound ;
> Where he abides think there thy native soil.
> (XI.290)

This duty of the wife to go wherever her husband goes (too often flouted today) is re-emphasized when at the moment of their departure from Eden, Eve, with true insight, bids Adam

> . . . lead on,
> In me is no delay ; with thee to go.
> Is to stay here ; without thee here to stay,
> Is to go hence unwilling ; thou to me
> Art all things under Heav'n, all places thou.
> (XII.614)

Constituents of the good life as Milton presents them are work, leisure, solitude, wisdom, prayer, and worship.

Among creatures, work is the high prerogative of men, for, says Adam,

> God hath set
> Labor and rest, as day and night to men . . .
> Man hath his daily work of body or mind

Appointed, which declares his Dignity,
And the regard of Heav'n on all his ways.
(IV.612-620)

Adam describes their work of lopping off the excess overgrowth of branches as " pleasant labor " (625). But he points out to Eve the needful and salutary uses of leisure.

Yet not so strictly hath our Lord impos'd
Labor, as to debar us when we need
Refreshment, whether food, or talk between,
Food of the mind, or this sweet intercourse
Of looks and smiles, for smiles from Reason flow,
To brute deni'd, and are of Love the food,
Love not the lowest end of human life.
For not to irksome toil, but to delight
He made us, and delight to Reason join'd.
(IX.235)

Adam acknowledges, however, that " solitude sometimes is best society " (249). Warning against excess in knowledge, Raphael declares, " to know That which before us lies in daily life, Is the prime Wisdom " (VIII.192). Michael gives to Adam a picture of the good life of man on earth that reminds one of Socrates' similar picture of the ideal life in the simple, healthy state. [1]

. . . Men . . . fearing the Deity,
With some regard to what is just and right
Shall lead their lives, and multiply apace,
Laboring the soil, and reaping plenteous crop,
Corn, wine, and oil ; and from the herd or flock,
Oft sacrificing Bullock, Lamb, or Kid,
With large Wine-offerings pour'd, and sacred Feast,
Shall spend their days in joy unblam'd and dwell
Long time in peace by Families and Tribes
Under paternal rule : (XII.15)

Instructed by the panorama of history which Michael has shown him, Adam sums up the good life as he now sees it :

Henceforth I learn that to obey is best,
And love with fear the only God, to walk
As in his presence, ever to observe
His providence, and on him sole depend,
Merciful over all his works, with good
Still overcoming evil, and by small
Accomplishing great things, by things deem'd weak
Subverting worldly strong, and worldly wise

1. Plato, *Republic*, Bk.II.

By simply meek ; that suffering for Truth's sake
Is fortitude to highest victory,
And to the faithful Death the Gate of Life ;
Taught this by his example whom I now
Acknowledge my Redeemer ever blest. (561)

Michael calls this the sum of wisdom, but admonishes him further :

. . . only add
Deeds to thy knowledge answerable, add Faith,
And Virtue, Patience, Temperance, add Love,
By name to come call'd Charity, the soul
Of all the rest : then wilt thou not be loath
To leave this Paradise, but shalt possess
A Paradise within thee, happier far. (581)

Moral perfection falls far short, however, of man's supernatural destiny.[1] Precisely because man is " endu'd With Sanctity of Reason, " he can and should be

. . . grateful to acknowledge whence his good
Descends, thither with heart and voice and eyes
Directed in Devotion, to Adore
And worship God Supreme, . . . (VII.512)

In his poem Milton first introduces Adam speaking to Eve their mutual praise of God, while Satan eavesdrops to discover what their first words may reveal of their state :

. . . needs must the Power
That made us, and for us this ample World
Be infinitely good, and of his good
As liberal and free as infinite,
That rais'd us from the dust and plac't us here
In all this happiness, who at his hand
Have nothing merited, nor can perform
Aught whereof he hath need, . . . (IV.412)

In melodious verse, paraphrasing *Psalm* 148, Milton records the morning prayer of our first Parents in their happy, holy innocence.

Lowly they bow'd adoring, and began
Their Orisons, each Morning duly paid . . .
Nor holy rapture wanted they to praise
Their Maker, in fit strains pronounc't or sung . . .
More tuneable than needed Lute or Harp . . .
These are thy glorious works, Parent of good,
Almighty, thine this universal Frame,

1. *Paradise Lost,* in contrast to *The Faerie Queene,* never loses sight of God by concentrating merely on the moral virtues governing the relations of man to man.

Thus wondrous fair ; thyself how wondrous then ! . . .
Speak ye who best can tell, ye Sons of light,
Angels, for ye behold him, and with songs
And choral symphonies, Day without Night,
Circle his Throne rejoicing, ye in Heav'n,
On Earth, join all ye Creatures to extol
Him first, him last, him midst, and without end.
(V.144-165)

Glorifying God is the one activity of creatures that requires no moderation, for it alone

. . . leads to no excess
That reaches blame, but rather merits praise
The more it seems excess, . . . (III.696)

The efficacy of prayer is attested when God bids Michael go to Adam and Eve " Bewailing their excess " (XI.111) and " send them forth, though sorrowing, yet in peace " (117), at the very moment they

Had ended now their Orisons, and found,
Strength added from above, new hope to spring
Out of despair, joy, but with fear yet linkt :
(XI.137)

So impressed is Adam with the peace of heart won through prayer that he eloquently comments to his fellow-sinner :

Eve, easily may Faith admit, that all
The good which we enjoy, from Heav'n descends
But that from us aught should ascend to Heav'n
So prevalent as to concern the mind
Of God high-blest, or to incline his will,
Hard to belief may seem ; yet this will Prayer,
Or one short sigh of human breath, upborne
Ev'n to the Seat of God. (141)

The reason for the efficacy of their prayer is shown in Heaven, where the Son intercedes for man before the Father's throne :

. . . hear his sighs though mute ;
Unskilful with what words to pray, let me
Interpret for him, me his Advocate
And propitiation, . . . let him live
Before thee reconcil'd . . . till Death . . .
To better life shall yield him, where with me
All my redeem'd may dwell in joy and bliss,
Made one with me as I with thee am one. (31-44)

The supernatural destiny of man is emphasized throughout *Paradise Lost*, for the children of Adam are to take the place of the

fallen Angels and for all eternity join their voices to the faithful spirits who sing in happy, ceaseless praise of the Deity :

> Fountain of Light, thyself invisible
> Amidst the glorious brightness where thou sit'st
> Thron'd inaccessible, but when thou shad'st
> The full blaze of thy beams, and through a cloud
> Drawn round about thee like a radiant Shrine,
> Dark with excessive bright thy skirts appear,
> Yet dazzle Heav'n, that brightest Seraphim
> Approach not, but with both wings veil their eyes.
> (III.375)

Milton pictures the highest perfection of God's intellectual creatures achieved in their sabbath worship of the Trinity through the

> . . .acclamation and the sound
> Symphonious of ten thousand Harps that tun'd
> Angelic harmonies : . . .
> The Heav'ns and all the Constellations rung,
> The Planets in their stations list'ning stood,
> . . . the solemn Pipe,
> And Dulcimer, all Organs of sweet stop,
> All sounds on Fret by String or Golden Wire
> Temper'd soft Tunings, intermixt with Voice
> Choral or unison : . . .
> Great are thy works, Jehovah, infinite
> Thy power : what thought can measure thee or tongue
> Relate thee ; . . . ? Who seeks
> To lessen thee against his purpose serves
> To manifest the more thy might : his evil
> Thou usest, and from thence creat'st more good . . .
> So sung they, and the Empyrean rung
> With *Halleluiahs* : Thus was Sabbath kept.
> (VII.558-634)

VII

From the evidence offered in this study it seems fair to conclude that an intelligent Catholic reader can enjoy in *Paradise Lost* the expression of dogmatic, moral, and philosophical truths impregnated with a power peculiar to poetry, the power not merely to teach but to delight and to move.

In this poem Milton insists, most strongly through Abdiel, that true freedom lies in obedience, for the Creator knows how the creature whom he has endowed with reason and free will and whom He assists with necessary preventing grace can achieve perfection. This discipline is not bondage. It is a false view, based on a false evaluation of self, that sees freedom in rebellion. Through rebellion Satan

experiences a " Hell within him " (IV.20), whereas through obedience Adam is assured a " Paradise within " him (XII.586). From free will flow the responsibility for choice and the consequent justice of punishment for disobedience (I.26). Milton shows sin as an essential violation of order multiple in its evil effects. Adam and Eve, " manifold in sin " (X.16), give way to anger, hate, mistrust, suspicion, discord, and sensual appetite (IX.1123-29). The proliferating nature of sin is most strikingly represented in the allegory of Sin and Death (II.790-797). The mistaking of appearance for reality, of false values for true, is most forcibly illustrated in Satan who thought Sin beautiful when she sprang from his brow in Heaven (V.668) and extremely revolting when he saw her blocking his passage at the gate of Hell (II.681). Impressive is the contrast between the two outcomes of the struggle of Satan against God for the soul of man. The first is Satan's false expectation of triumph in Hell ironically ending in a universal hiss (X.545). The second is the panorama of God's ways to men of good will, shown in Books XI and XII, in which through the Redeemer mercy triumphs over revenge, love over hate, good over evil. With the vast scene of its action moving always under the omniscient eye of the serene, majestic Triune God, beholding in one glance Earth, Hell, and the heavenly spheres, *Paradise Lost* conveys a sense of the reality and the unity of the invisible spiritual world — God, angels, demons, and the souls of men — and the supernatural destiny of all intelligent spirits to glorify their Creator in time and in eternity.

Sister Miriam Joseph, c.s.c.

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